Predictors of Health and Health Behaviours in People with Heart Related Health Problems

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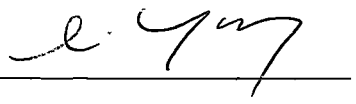
I declare that this thesis is my own work and that, to the best of my knowledge and belief, it does not contain material from published sources without proper acknowledgement, nor does it contain material which has been accepted for the award of any other higher degree or graduate diploma in any university.

Signature  Date 17/08/10

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Literature Review Abstract

An extensive amount of research has been conducted on mortality and morbidity in patients who have experienced an acute cardiac event. The literature includes findings regarding predictors of attendance and adherence to Cardiac Rehabilitation (CR) Programmes and factors which are related to the development of Coronary Heart Disease (CHD). This literature discusses the factors that predict health behaviours and perceptions of general health; socio-demographic variables, depression, social support and coping. Specifically, lower socioeconomic status is related to higher levels of stress hormones, greater likelihood of smoking, less likelihood of eating breakfast, and less diverse social networks. Depression and CHD appear to be independent risk factors for the development of each other. Being in an intimate relationship is associated with less mortality after an acute cardiac event, while active coping styles are associated with positive well-being at later time points after heart attack. Despite the extensive research in this area, the mechanisms underlying the relationships between these factors remain unclear. Also, a large amount of variance in health and health behaviour accounted for by psycho-social and demographic variables overlap. Hence little is known about the unique variance accounted for by these factors.

Coronary Heart Disease

Coronary Heart Disease is a condition that develops over time due to a build up of fatty cholesterol deposits in the wall of arteries in the heart, known as atherosclerosis (National Heart Foundation, 2004). When coronary arteries become partially blocked, the heart struggles to supply enough blood, carrying oxygen during times of stress and exercise, placing strain on the heart as it tries to pump harder to meet demands. This can lead to angina and heart attack (Myocardial Infarction: MI), which can lead to permanent damage to the heart muscle (National Heart Foundation, 2004). Angina usually manifests as temporary chest pain and is due to a reduced supply of blood to the heart muscle. MI occurs when there is a coronary occlusion, a sudden blockage of an artery, and is typically characterised by squeezing, discomfort, pressure or pain in the chest lasting more than 10 to 15 minutes. Severe chest pain is the most common symptom of MI, although for some MI patients, particularly women and people with diabetes, chest pain is not always present (Gupta, Tabas & Kohn, 2002).

Atypical MI symptoms are commonly present in women. As a result diagnosis and treatment are often delayed or managed inadequately (Arnstein, Buselli & Rankin, 1996). Hence, women have a poorer prognosis and greater disability after MI compared with men (Oparil, 1998). With life expectancy increasing significantly over the last few decades and women tending to develop CHD later in life, it has become the leading cause of death in women after a long focus of it as a male problem (Manson, Shlipak & Wenger, 2001).

Despite a considerable decline in death rates over the past few decades CHD led to nearly 24 000 deaths in 2007 and remains the leading cause of death in Australia (Australian Institute of Health and Welfare: AIHW, 2010), accounting for 18% of all deaths in men and 17% in women. This reductions in CHD related deaths appears to be due to greater public

awareness of MI symptoms and importance of getting medical assistance without delay, as well as increasing numbers of people trained to carry out cardiopulmonary resuscitation (CPR) and general improvements in treatment (Luepker, et al., 2000). CHD is a great financial burden on the public health system, with large costs associated with treatment and rehabilitation, accounting for 16% of all disease-burden in Australia (AIHW, 2010). After a MI, anxiety, depression and fear of undertaking physical activity are common reactions (Moser, Riegel, McKinley, Doering, An & Sheahan, 2007). Possible medical complications include subsequent MI, death of heart muscle and potentially heart failure.

Medical treatments for CHD include angioplasty, bypass surgery, heart transplant, fitting of a pacemaker, and medication (National Heart Foundation, 2006). Angioplasty involves widening a blocked or narrowed blood vessel using a balloon which is inflated to crush fatty deposits and allows improved blood flow. Bypass surgery involves grafting arteries or veins from another part of the body to bypass narrowed arteries. Pacemakers are a medical device implanted under the skin to regulate the heart beat. Lifestyle changes are also strongly recommended as an important component of treatment for CHD. The top four unhealthy behaviours that contribute to disease burden in Australia (AIHW, 1999) are smoking tobacco, physical inactivity, excessive alcohol consumption, and lack of fruit and vegetables. Thus, to regular physical activity, reduce levels of smoking and dangerous levels of alcohol consumption, and to maintain a healthy balanced low fat diet, high in fruit and vegetable intake (Jackson, et al., 2005).

Cardiac rehabilitation (CR) programmes have been developed to assist patients in improving their quality of life and longevity, usually following a cardiac event (Sin, Sanderson, Weaver, Giger, Pemberton, & Klapow, 2004). Fewer CR programs are available for patients diagnosed with CHD who have not had a major cardiac event. CR programs aim

to increase fitness, reduce blood pressure, reduce cholesterol, improve body composition and body weight, lower emotional stress and anxiety, and reduce the risk of subsequent MI. Despite the availability and recognised efficacy of exercise training for cardiac patients, only 10 to 20 percent of eligible patients take up CR (Sin, et al., 2004). Continued adherence to proscribed exercise regimes over time is low (Willich, Muller-Nordholm, Kulig, Binting, Gohlke, Hahmann, Bestehorn, Krobot & Voller, 2001). Habitual behavioural patterns such as inactivity, eating a diet high in cholesterol, smoking, and drinking at unsafe levels, are highly resistant to change (Sutton, 1994). Many of the intervention studies conducted have been run over relatively short periods of time, hence the knowledge of maintaining behaviour change is limited (Luszczynska , 2006; Luszczynska, Scholz & Sutton, 2007).

Importantly, it also seems that people who perceive they can manage their health behaviour changes independently are less likely to participate in CR programs (Frewen, Schomer & Dunne, 1994). Thus, though there are low levels of engagement in CR programs, some people report a desire or intent to attempt self-initiated health behaviours. Few studies have explored the factors that predict people who successfully undertake self initiated health behaviour changes. There is evidence from one study by Schroder and Schwarzer (2005) that people's skills in self-regulating their own health play a role. For example, in a study of 381 heart surgery patients, they found that people who have high control over their health behaviours generally, were more likely to engage in positive health behaviours than were a person's level of dispositional optimism, generalised self-efficacy beliefs, and health locus of control beliefs (Schroder & Schwarzer, 2005).

Numerous studies, guided by either the Theory of Planned Behaviour (Ajzen, 1991), or Health Belief Model (Rosenstock, 1974) have examined other types of predictive variables for the uptake of positive health behaviours, mainly exercise (Frewen, et al., 1994). The

Theory of Planned Behaviour is a theory regarding the link between attitudes and behaviour. The Health Belief Model attempts to explain and predict health behaviours by focussing on people's attitudes and beliefs. Both models produce weak results in terms of predicting the relationship between intention to exercise and actual exercise (Blanchard, Courneya, Rogers, Daub, & Knapik, 2002; Frewen., et al, 1994; Johnston, Johnston, Pollard, Kinmonth, & Mant, 2004).

Despite a large body of research having been conducted in the area, there are many questions still remaining with regards to factors that lead to favourable health outcomes in people with CHD. Studies thus far indicate that depression, socio-demographic factors, social support, coping, health and medical factors and barriers to health behaviour change are, broadly speaking, significant predictors of health behaviour change and health outcomes in people with CHD and of risk of developing CHD.

Depression

Major depression and CHD are the two most disabling diseases world wide (Wulsin, et al., 2009). They often co-occur, and when this happens, rates of mortality and morbidity are increased. Commonly, patients with a new diagnosis of CHD develop depression and people with depression are more likely to develop CHD than those who are not depressed (Reddy, Dunbar, Morgan, & O'Neil, 2008). It is well established that patients with CHD and depression have higher mortality rates than those without depression, however, the mechanisms underlying this effect are not well understood (Bremner, et al., 2009). Despite this, and the great amount of literature on the topic, it does indicate that these conditions act as independent risk factors for the development of the other (Wulsin, et al., 2009).

An advisory by the American Heart Association, endorsed by the American Psychiatric Association, advised that patients with CHD should be routinely screened for

symptoms of depression, as treatment of depression may improve health outcomes for CHD patients (Mitka, 2008). CHD patients with depression tend to struggle more in their recovery including lower adherence to medication regimes and cardiac rehabilitation. The literature indicates that fifteen to twenty percent of patients meet the criteria for major depression after an acute cardiac event (Egede, 2007). However, as yet there is no direct evidence to suggest that treatment of depression improves CHD status. Treatments commonly used for CHD patients with co-morbid depression include Cognitive Behavioural Therapy, physical activity, Cardiac Rehabilitation and antidepressant medication, specifically, Selective Serotonin Reuptake Inhibitors. Some evidence suggests that patients may still be at risk of subsequent cardiac events, even once they have been treated for depression (Mitka, 2008). This leaves researchers with the question of, if treating depression doesn't improved CHD outcomes, what are the mechanisms by which depression increases the risk of developing CHD and worsens prognosis in patients after MI?

Risk factors for the development of CHD include hypertension, high cholesterol, smoking and diabetes (Wilson, D'Agostino, Levy, Belanger, Silbshantz, & Kannel, 1998). More recent research has recognised intra-abdominal fat and psychosocial factors, such a as depression, as accounting for additional CHD risk (Yusuf, Hawken, Ounpuu, Bautista, Grazia Franzosi, Commerford, Lang, Rumboldt, Onen, Lisheng, Tanomsup, Wangai, Razak, Sharma, & Anand, 2005). One characteristic of depression is vulnerability to stress and heightened stress responsiveness (Bremner, et al., 2009). It has been observed that some individuals are vulnerable to stress-induced MI (Arrighi, et al., 2000), in which restricted blood flow may be painless and seen at a lower heart rate than those with exercise induced MI. This emphasises the significance of the emotional contribution to acute cardiac events.

Along with depression being a risk factor for developing CHD, it also worsens

prognosis in those who have CHD, including increasing rates of subsequent cardiac events and death. Patients with depression are 3.5 times more likely to die shortly after MI than those without depression (Glassman & Shapiro, 1998). There are a number of theories regarding the link between depression and CHD, including changes in the autonomic nervous system seen in depressed patients, the possibility that antidepressant medication may worsen CHD risk, people with depression show higher rates of smoking (Morell, Cohen & McChargue, 2010) which increases their risk for CHD, and that depression itself causes CHD. It has been well established that there is an increased risk of CHD with a diagnosis of major depression, but many questions remain. Including does severity of depression, chronicity of depression or presence of depressive symptoms without a diagnosis impact on CHD outcomes? The research suggests that recurrent episodes of major depression lead to increased risk of death from CHD, but not in cases when major depression develops after a first cardiac event (Lesperance, Frasure-Smith, & Talajic, 1996). While there is a wide body of research speculating on the links between depression and CHD, the literature on the impact of other negative mood states, such as anxiety, is much less extensive and much less sophisticated.

Despite evidence that depression is an independent aetiological and prognostic factor for CHD, it is often not recognised or integrated into managing CHD in the cardiac setting. This is particularly concerning as the risk of subsequent CHD morbidity and mortality is increased by 1.5 to 2 fold in those with depression (Goldston & Baillie, 2008).There is also evidence indicating that depression increases CHD risk as much as smoking, high cholesterol and hypertension (Goldston & Baillie, 2008). Behavioural mechanisms behind the depression CHD link include; depressed people are more likely to smoke and find it more difficult to quit, they are less likely to be physically active, less likely to have a healthy diet, and they are also less likely to adhere to treatment recommendations (Taylor, Barber, & Macintosh, 1998). The INTERHEART study further supports the aetiological link between depression and CHD.

Their findings indicating that the population-attributable risk of combined psychosocial factors was thirty three percent, 9 percent of which being attributable to depression (Rosengren, Hawken, Ounpuu, Sliwa, Zubaid, Almahmeed, 2004). Still the psychosocial mechanisms are not well understood.

Socio-demographic Factors

There is a lot of literature on predictors of behaviour change in people with heart disease. Much of the early research has focussed on identifying predictors of attendance and adherence to CR programmes after hospitalisation for MI. Socio-demographic factors associated with non-attendance and drop-out from CR programs include being older, lower income, and greater financial deprivation (Cooper, Jackson, Weinman, & Horne, 2002) time constraints and inconvenience, unemployment, being female, greater distance from the CR delivery centre (Sin, et al., 2004), and low levels of education. Recent research has focussed on factors which contribute to the development of CHD and worsening of outcomes in patients with CHD, such as income, education, employment, housing, age and gender.

A study by Hemmingway (2007) looked into determinants of CHD risk and health behaviour in women on a low income. Firstly, this study indicated that greater levels of income deprivation were related to greater CHD risk. They also found that slight differences in job/employment status and income have a significant impact on CHD risk, including impacting on people's level of smoking, exercise and diet (Marmott, et al., 1991; Hemingway, Shipley, Macfarlane, & Marmot, 2000). These findings, specifically, those of Marmott et al. (1991) are seminal. It is also suggested that lower SES is related to higher levels of stress hormones, greater likelihood of smoking, less likelihood of eating breakfast and less diverse social networks (Rose, et al., 2004).

Educational attainment level appears to have an impact on SES, as it affects social and

economic position, which in turn can influence income, housing and overall material resources (Mack, Anderson, Galuska, Zablotsky, Hotlzman, & Ahluwalia, 2004). The link between educational attainment and CHD risk is not well understood. It has been postulated that those with greater educational attainment have greater income, more control over their work and high social status, all which lead to reduced stress in day to day life (Stansfield & Marmot, 2002). Also, those with greater educational attainment seem to have more positive health behaviours, possibly due to increased chance of greater exposure to information around health, diet and exercise. It appears that the socio-economic conditions which would be likely to lead to greatest risk of developing CHD are little control over work, great work demands, and little social support (Stansfield & Marmot, 2002). Much of the research about the impact of work and SES on heart health is conducted on men, hence it offers a limited view on the topic.

The link between SES and CHD risk is not well understood, however, there are some theories about the underlying pathways. These suggested pathways include, consideration of the links between heart health, SES and biomedical, psychosocial and behavioural factors. Lower SES is associated with impaired functional exercise capacity (on a stress test for evaluating suspected CHD) and abnormal heart rate recovery (Shishehbor, Litaker, Pothier & Lauer, 2006). Also, psychosocial stress associated with lower SES leads to greater atherosclerosis and MI (Marmot, Bosma, Hemingway, Brunner & Stansfeld, 1997). Also, lower SES is associated with greater barriers; access costs and health literacy, to modifying risky health behaviours, such a smoking, diet, exercise and adherence to medications (Fiscella, & Tancredi, 2008).

The findings of recent research highlight the importance of taking socio demographic variables into account when looking into predictors of CHD risk and health outcomes and

health behaviour in people with a diagnosis of CHD. More research must be conducted to further the understanding of the pathways behind socio demographic factors effects on heart health.

Social Support

The impact of social support variables on adjustment and health outcomes in CHD is important as interconnection between individual coping and mutual support processes within close relationships. This has implications for both patient's and their partner's adjustment to stressors, such as having an acute cardiac event. It has been postulated that interpersonal support processes may explain a lot of the difference between intention to engage in positive health behaviours and actual health behaviour. For instance, being in an intimate relationship is associated with less mortality after a myocardial infarction (MI) and better adherence to CR. Patient's and care-givers mood tends to also co-vary and predicts patients' adjustment. In a study of 417 patient–spouse pairs recruited after the patient was hospitalised for a coronary event, it was found that patients' psychosocial adjustment to illness was worse when the care-giving spouses were more anxious or depressed than the patients (Moser & Dracup, 2004).

Unfortunately most studies use global markers of social support variables, such as marital status, that do not inform our understanding of the nature of the relationship between social support and a person's adjustment to illness. For example, Rankin-Esquer, Houston-Miller, Myers and Taylor (1997) found that non-married participants were less likely than married participants to complete a 12 month, home-based, multifactorial risk reduction programme following cardiac event or surgery. Further non-married participants were more likely to smoke at baseline, and separated participants were more likely to continue or start smoking after MI (Rankin-Esquer, et al., 1997).

Few studies have collected data from CHD patients and their spouses. Of those studies

which have included spousal data, most have not examined lifestyle changes but have instead assessed patient survival, mental health, and functional capacity (Benazon, Foster, & Coyne, 2006; Rohrbaugh, Shoham & Coyne, 2006; Stewart, Davidson, Meade, Hirth, & Makrides, 2000). Considering that lifestyle changes are crucial for both psychological adjustment and survival in CHD patients, it seems imperative to investigate what helps and hinders the uptake of self-directed positive health behaviour change and the effect of social support in this process.

Due to the aforementioned shortcomings in studies looking into the effect of social support on CHD development and outcomes, the mechanisms behind this relationship is not well understood. Several prospective studies show a significant negative correlation between level of social support and CHD mortality and morbidity (Eriksen, 1994). This may be due to the protective effect of social support which can moderate the effects of negative emotional states on health. Other theories of how social support effects CHD include; that low levels of social support are associated with high blood pressure, high cholesterol and smoking; social support acts as a stress buffer; there is a greater association between social support and mortality than between social support and morbidity. There is evidence to indicate that social support has an effect on the pathogenesis of CHD via influencing affective state, neuroendocrine system and the autonomic nervous system (Eriksen, 1994). Also, by having social support, patients may be provided with practical help or healthcare that can prevent disease progression from less serious to more serious.

Animal studies have helped to being about knowledge about the link between stress, social support and CHD. In a study of monkeys who were fed a high fat diet and constantly exposed to stress for a period of 22 months, the monkeys showed greater atherosclerosis than those who also received the high fat diet, but less stress (Hamer, 2006). Subsequent studies

found that monkeys living in disrupted social groups also had more extensive atherosclerosis. Similar outcomes have been found in human studies, with high prevalence of atherosclerosis and faster progression in women with martial dissatisfaction and an increased death rate of care givers under emotional strain during follow up (Hamer, 2006). For some people, seeking emotional support from others and venting are important coping strategies.

Coping

Coping can be defined as the process of managing stressful situations. Many studies have indicated that stress has a significant impact on health and on CHD risk and progression of CHD over time. Ability to cope with stressful events (such as CHD diagnosis) appears to act as a buffer with regards to the effect on health. Hence coping ability and coping styles are important considerations when looking into predictors of health outcomes, health behaviours and people at risk of developing heart disease. Research has been conducted to examine the role of coping styles in CR attendance and adherence.

Coping styles have been used to predict CR attendance, hospital re-admission, anxiety, depression and well-being in CHD patients. Attenders of CR programs tended to use problem-focussed and emotion-focused coping more frequently than poor/non-attenders. Non-attenders used maladaptive and avoidant coping stategies more often than attenders (Whitmarsh, Koutantji, & Sidell, 2003). For those who had been admitted to hospital for the first time (for MI), greater use of the coping strategy 'seeking social support' was associated with readmission. For those who had been admitted to hospital for MI on multuiple occasions, less use of 'accepting responsibility' as a coping strategy was associated with re-admission (Libbus, 1997). In a study which examined approach and avoidance as coping styles over three time points, avoidance was shown to be positively related to well-being at the first time-point. However, approach at the first time point was positively related to well-being at later

time points. Also, approach at the first time-point was negatively related to depression and anxiety at later time points (Van Eldern, Maes, & Dusseldorp, 1999). This study indicates that although approach as a coping style can be distressing early on for CHD patients, facing problems head on can be beneficial later on. Similarly, another study indicates that blunting (a form of avoidant coping) is positively associated with well-being in CHD patients soon after discharge from hospital, especially those with low self-efficacy for problem focussed coping (Bedi & Brown, 2005). Although the research suggests mixed results, in the long-term approach coping strategies appear to be related to better psychological adjustment, including lower levels of depression in MI patients.

Approach versus avoidant coping refers to an emotional or cognitive way of either facing towards or away from a problem or stressor (Roth & Cohen, 1986). Generally, approach coping involves strategies such as acceptance, planning and use of emotional support, whilst avoidant coping includes strategies such as denial, behavioural disengagement and self-blame.

Seeking support from others is one of many coping strategies adopted by people who have experienced MI. Within the limited literature on coping in people with heart disease there are mixed results regarding the costs and benefits of approach and avoidant coping styles (Van Eldern, et al., 1999). Conversely, psychosocial factors that predict engagement and positive outcomes from CR include exercise enjoyment, self-motivation (Frewen, et al., 1994), perceived greater number of symptoms and consequence of their illness, greater distress, and use of problem focussed coping (Whitmarsh et al., 2003).

A study conducted on women in the workforce found that participants with CHD had higher levels of burnout and less ability to cope with stressful situations than those without CHD (Hallman, Thomsson, Burell, Lisspers, & Setterlind, 2003). They also found an

association between educational level and coping strategies.

Coping styles have been used to predict hospital readmission in patients with prior hospitalisation due to CHD. One study followed 24 people who were readmitted to hospital during the four month study period (Libbus, 1997). They were divided into two groups; those had been admitted only once for CHD at the start of the study period, and those who had been admitted multiple times for CHD. They found that greater use of the coping style 'seeking social support' was associated with first readmission for CHD, whereas, less use of the coping style 'accepting responsibility' was associated with readmission for those with prior readmissions for CHD. This indicates that early in patients' CHD journey there is a tendency to seek support from loved ones, however, the use of 'active coping' and 'planning' may be more useful in changing health behaviours which may lead to fewer hospital readmissions. It seems that the use of 'denial', 'distraction' and low use of 'accepting responsibility' are more likely to experience multiple admissions.

Health and Medical Factors

There are a broad range of health and medical factors that may impact on health outcomes in people with CHD. Medical barriers to uptake of positive health behaviours include co-morbid medical conditions (Aggerwal & Ades, 2001), high risk health status (Sin, et al., 2004) perceptions of symptoms and controllability, perceptions that their physician is not strongly recommending cardiac rehabilitation (Cooper, et al., 2002) and the perceived complexity of required health behaviour changes.

Body Mass Index (BMI) has been found to be related to development of CHD (Frasure-Smith, Lesperance, Irwin, Talajic & Pollock, 2009). Currently, little is known about how BMI impacts on health behaviour change in those with CHD or high risk for its development.

Due to a vast combination of health and medical factors which may be experienced by patients with CHD, an individual approach to treatment and rehabilitation is of the utmost importance to achieve positive health outcomes and health behaviour change. In general, CR programs are not tailored to the individual, which may explain large drop out rates and lack of adherence. Consideration of barriers for each individual, relating to health and medical factors, factors related to the health system and individual factors is necessary when designing a treatment/rehabilitation program for patients with CHD.

Barriers and Obstacles to Health Behaviour Change

People with CHD and those with risk factors for developing CHD commonly come up against many barriers to improving their health behaviours to achieve more positive health outcomes. Some of these barriers include greater distance from health care providers, health professional's limited time and knowledge about which health behaviours should be targeted, limited access to relevant information about health and health behaviours, co-morbid medical problems (i.e. obesity, arthritis and diabetes), difficulty quitting smoking, impact of detrimental health behaviours of other people in the family, finding time to exercise, finding a suitable exercise, knowing how to eat healthily when dining out, dealing with the elements when exercising outdoors, changing eating habits and learning how to cook differently.

Secondary prevention is viewed as very important by health care professionals in the CHD area. However, research consistently suggests that delivery of these services is inadequate (Piette, 1996). The greater use of information technology may offer solutions in overcoming barriers to service access for patients who live significant distances from service delivery centres. For example phone contact or video-conferencing could be used between ambulatory care visits.

Lack of physician knowledge is another barrier to maximising health behaviour

change in primary and secondary prevention of CHD. One study looked into physician knowledge levels with regards to CHD risk prevention in women and found that about half of the medical professionals did not know that smoking is a leading cause of MI in young women (Barnhart, Lewis, Houghton, & Charney, 2007). This indicates that physicians are less likely to place importance on quitting smoking for CHD risk prevention.

CHD is the biggest cause of death in the UK, but only fifty percent of patients who receive a diagnosis get proper secondary preventative care (Gilder, Moher, & Schofield, 1996). Some of the reasons suggested for this lack of follow up include GP's lacking the necessary time to aid patients in accessing services, patient's being more likely to receive advice on secondary prevention at specialised clinics and not everyone has access to these, and lastly that mental and physical co-morbidities mitigate against secondary prevention (Summerskill, & Pope, 2002). By this, it may mean that GP's and heart specialists do not know how to facilitate secondary prevention in people with complex health presentations, or that the patients find it more difficult than others without co-morbid health conditions to make necessary lifestyle changes due to facing more barriers associated with their health.

It could be said that there are many barriers within the health system that may lead to worse outcomes for patients with CHD. This is before individual differences and health co-morbidities have been taken into account. When system barriers and individual barriers are considered in combination, it is not surprising that for many people it is very difficult to change and maintain changes to lifestyle factors and health behaviours to improve their heart health.

Conclusion

A substantial amount of evidence has been presented in this review, indicating that there are a number of factors that predict health outcomes in CHD patients and those at risk of

developing it. The research also suggests that there is a significant amount variance shared between many of these predictor variables. Hence, the current study aims to investigate the unique variance in health and health behaviour as accounted for by depression, social support, socio-demographic factors coping, and health factors, specifically BMI.

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Empirical Study

Predictors of Health and Health Behaviour in People with Heart Related Health Problems

Empirical Study Abstract

Coronary heart disease (CHD) is the leading cause of death in Australia. An extensive body of research has been conducted into factors related to positive health outcomes and health behaviour in people with CHD. This research indicates that psycho-social and demographic factors play an important role in determining adjustment in patients after an acute cardiac event, but also in the development of CHD. Despite the extensive research on this topic, many questions remain regarding the underlying mechanisms behind the relationships between psychosocial and demographic variables and general health and health behaviour. The present study aims to build on the understanding of these relationships. Specifically, the study looks at the unique variance in patients' perceived overall general health and health behaviour accounted for by education, depression, Body Mass Index (BMI) social support and coping. The participants were 57 people who had either been diagnosed with CHD or had been advised to make changes to their lifestyle for their heart health because of high risk for developing CHD. They were recruited through the UTAS School of Psychology on-line study web page, a General Practitioner, and an allied-health professional at the Royal Hobart Hospital. Participants completed a one-off assessment booklet either on-line or via a mail out survey. Three separate hierarchical multiple regressions were employed to investigate the aims of the study. The first used level of educational attainment, depression, social support (satisfaction and size of social network) and coping effort to predict unique variance in perceived overall general health. The second used BMI, social support (satisfaction and size of social network) and coping to predict unique variance in intention to exercise. The third regression used social support (satisfaction and size of social network) and coping effort to predict unique variance in intention to eat a healthy diet. Consistent with the hypotheses, higher levels of educational attainment predicted better overall perceived general health. Also as predicted, lower levels of depression were related to high levels of perceived overall

general health. Contrary to predictions, social support (satisfaction and size of social network) and coping effort were not found to be related to health. The hypothesis that a greater BMI would be predict lower intention to exercise was supported, as was the hypothesis that a larger social network would be associated with intention to exercise. Satisfaction with social support and coping effort were not found to be related to intention to exercise. The hypothesis that a larger social network would be associated with a greater intention to eat a healthy diet was supported by the findings, however, satisfaction with social support and coping effort were not found to be related to intention to eat a healthy diet. It was concluded that depression and level of educational attainment are of great importance when considering factors associated with positive general health outcomes in people with CHD and heart health concerns. This has implications for health care professionals, with regards to primary and secondary prevention of CHD in people with low levels of educational attainment and also the importance of screening for depression in people after a diagnosis of CHD.

Coronary heart disease (CHD) is a condition in which plaque builds up in the coronary arteries, a process known as atherosclerosis. These arteries supply the heart with oxygen-rich blood, which is pumped around the body. Over time, plaque narrows arteries causing partial or complete blockage, which leads to angina (chest pain) and heart attack, also known as myocardial infarction (MI). MI occurs when a coronary artery becomes completely blocked, preventing oxygenated blood from reaching the heart muscle. If MI is not treated immediately, it can result in serious problems, including heart muscle damage, or death. Over time, CHD can lead to heart failure, an inability to pump enough blood around the body, and arrhythmias, that is, abnormalities with pace and rhythm of the heart beat.

Although there has been a significant reduction in CHD related deaths in the last few decades, it remains the leading cause of death in Australia (AIHW, 2010). It accounts for 18% of all deaths in men and 17% of all deaths in women, resulting in a great financial burden on the health system, with high costs associated with treatment and rehabilitation (AIHW, 2010). Common psychological reactions post MI include anxiety, depression, denial and fear of undertaking physical activity (Moser, Riegel, McKinley, Doering, An & Sheahan, 2007). Complications associated with CHD include subsequent MI, heart muscle damage, and heart failure, which can lead to the need for heart transplant.

Emergency medical treatments for acute cardiac events (MI) include angioplasty, placement of stents and bypass surgery. Follow-up treatments and management involve medication and lifestyle change. The top four unhealthy behaviours that contribute to heart disease in Australia are smoking, physical inactivity, excessive consumption of alcohol and having a diet high in saturated fats (AIHW, 1999). Not only do these behaviours play a large role in the development of heart disease, but they are also important in reducing progression of CHD, subsequent MI and CHD related deaths. Thus, to reduce symptoms and further CHD

complications, patients are encouraged to exercise regularly, reduce levels of or quit smoking, cut down on alcohol consumption and eat a low-fat, well balanced diet (Jackson, etal., 2005).

Cardiac rehabilitation (CR) programmes have been developed to support post MI patients in improving their quality of life and longevity through changes in lifestyle and health behaviours (Sin, et al., 2004). CR programmes aim to assist patients to improve their fitness, reduce blood pressure, lower cholesterol, improve body composition and body weight, lower emotional stress and anxiety, and reduce the risk of subsequent MI. Despite the relatively wide availability of CR and recognition of efficacy of exercise training for cardiac patients, only ten to twenty percent of eligible patients take part (Sin, et al., 2004). Also, limited CR programmes are available for CHD patients who have not had a major cardiac event.

There is evidence to suggest that continued adherence to proscribed exercise regimes over time is low (Willich, et al., 1994). There is also research which indicates that habitual behavioural patterns such as inactivity, eating a high-fat diet, smoking and drinking at unsafe levels, are highly resistant to change (Sutton, 1994).

Many of the CR intervention studies have been run over relatively short periods of time, therefore, knowledge about long-term maintenance of behaviour change is limited (Luszczynska , 2006; Luszczynska, Scholz & Sutton, 2007). It also seems that people who believe they can manage their own health behaviour change independently are less likely to participate in CR programs (Frewen, Schromer & Dune, 1994).

Few studies have investigated which factors predict successful self-initiated health behaviour change in people with CHD. Findings from a study by Schroder and Schwarzer (2005) indicated that control over health behaviours was more important than a person's level of dispositional optimism, generalised self-efficacy beliefs, and health locus of control beliefs in predicting positive health behaviour (Schroder & Schwarzer, 2005).

Several studies, based on either the Theory of Planned Behaviour (Ajzen, 1991), or Health Belief Model (Rosenstock, 1974) have investigated various predictive variables for the uptake of positive health behaviours (Frewen, et al., 1994). Both models produced weak results in predicting the relationship between intention to exercise and actual exercise behaviour (Blanchard, Courneya, Roers, Daub & Knapik, 2002; Frewen, et al., 1994; Johnston, Johnston, Pollard, Kinmonth & Mant, 2004). The poor predictive utility of these models may be due to failure to take into account relevant psycho-social and demographic factors.

There is a large body of research which examines predictors of health behaviour and health outcomes in people with heart disease and risk factors for its development, however, there are many questions remaining about the underlying mechanisms at work. Studies thus far indicate that depression, socio-demographic factors, social support and coping are associated with health behaviour change and general health in people living with CHD and those at risk of developing CHD.

Along with CHD, depression is one of the most disabling diseases in the world (Wulsin, et al., 2009). CHD and depression often co-occur, and when they do, rates of morbidity and mortality are increased. It is common for people to develop depression soon after an acute cardiac event and people with depression are more likely to develop CHD than those who are not depressed (Reddy, Dunbar, Morgan, & O'Neil, 2008). Wulsin et al. (2009) found that depression is an independent risk factor for CHD, and thus a risk factor for worse general health. Another study found that depression accounts for additional CHD risk, above and beyond traditional risk factors, such as inactivity, smoking and high cholesterol levels (Yusef, et al., 2005). However, the mechanisms underlying the relationship between depression and CHD development, morbidity and mortality is not well understood.

Recent literature has explored socio-demographic factors, such as income, education, employment status, age and gender, and their ability to predict the development and progression of CHD. Hemmingway's (2007) literature review on CHD risk and health behaviour in women on a low income found that greater levels of financial deprivation was related to higher risk of developing CHD. It was also found that small differences in employment level and income have a significant impact on CHD risk, including an influence on smoking behaviour, levels of physical activity and diet. Level of educational attainment appears to have an impact on socio-economic status (SES), as it affects social and economic position, which in turn can impact upon employment status, housing and overall material resources (Mack, et al., 2004). Other research findings indicate that lower SES is related to higher levels of stress hormones, greater likelihood of smoking, less likelihood of eating breakfast and less diverse social networks (Rose, et al., 2004).

It is important to consider the impact of social support variables on adjustment and health outcomes in CHD, as this has implications for both patients and their partners and their adjustment to related stressors. Past research has found that being in an intimate relationship is associated with less mortality after an acute cardiac event and better adherence to CR (Moser & Dracup, 2004). These findings are consistent with those from Eriksen (1994), who found that greater levels of social support are related to lower levels of cardiac mortality and morbidity, and in turn, better general health. Findings by Hamer (2006) were also similar, with greater marital distress being related to a higher prevalence and faster progression of atherosclerosis. In another study Rankin-Esquer, Houston-Miller, Myers and Taylor (1997) found that non-married participants were less likely than married participants to complete a 12 month, home-based, multi-factorial risk reduction programme following MI or surgery. One of the problems with this kind of study is that it assesses social support through marital status, a global marker, which only provides minimal information about how social support

and a person's adjustment to illness are related.

Coping can be defined as the process of managing stressful situations. Ability to cope with stressful events, such as a recent diagnosis of CHD or MI can have a significant impact on health and adjustment over time. Also, ability to cope with stressful events in general can act as a buffer with regards to the effect on health, and in turn reduce the chance of CHD developing. Research has been conducted to investigate the role of coping styles in CR attendance and adherence, depression, anxiety and well-being soon after discharge from hospital. In a study which examined approach and avoidance as coping styles over three time points, avoidance was shown to be positively related to well-being at the first time-point post discharge. However, approach at the first time point was positively related to well-being at later time points. Also, approach at the first time-point was negatively related to depression and anxiety at later time points (Van Eldern, Maes, & Dusseldorp, 1999). This study indicates that although approach as a coping style can be distressing early on for CHD patients, facing problems head on can be beneficial later on. Similarly, another study indicates that blunting (a form of avoidant coping) is positively associated with well-being in CHD patients soon after discharge from hospital, especially those with low self-efficacy for problem focussed coping (Bedi & Brown, 2005). Although the research suggests mixed results, in the long-term, approach coping strategies appear to be related better psychological adjustment, including lower levels of depression in MI patients.

A large body of research has been conducted into factors associated with health behaviours and health outcomes in the CHD area. However, many questions remain unanswered. Previous research indicates that there is a large amount of overlap in variance between predictors of health and health behaviours, hence limited information about unique variance is known. Past findings are also limited by a number of other factors. These include

the use of global markers of social support, such as marital status, which does not provide information about aspects of social support such as satisfaction and size of social network. Also, the use of numerous sub-scales of coping, as in the Brief Cope (Carver, 1997), has questionable validity as each subscale is based on only 2 items. To have a single scale to measure coping would be useful, as it may indicate how much effort is being expended to cope with the need to make changes for heart health.

Education has been identified as a predictor of health and health behaviours in CHD research, however, little is known about its predictive utility in terms of unique variance. There has been a lot of research into depression as a predictor of health and health behaviour in the CHD area, including studies where researchers have controlled for traditional risk factors such as smoking, inactivity and high cholesterol levels. However, what remains unknown is how much unique variance in health and health behaviour is accounted for by depression once other psycho-social factors have been controlled for.

The present study aims to add to current knowledge about the relationship between psycho-social and demographic factors and health and health behaviour. Specifically, examining the unique variance in health accounted for by depression, level of educational attainment, social support (size of social network and satisfaction) and coping effort; the unique variance in physical activity accounted for by BMI, social support and coping effort; and the unique variance in dietary fat intake accounted for by social support and coping effort.

Hypotheses

Perceived Overall General Health

Firstly, it is hypothesised that a greater level of educational attainment will be related to a higher level of general health. The second hypothesis predicts that high levels of depression will be associated with low levels of general health. Thirdly, it is hypothesised that

higher levels of social support (satisfaction and size of social network) will be related to higher levels of general health. Finally, it was predicated that high levels of coping effort would be associated with better general health.

Intention to Exercise

It was hypothesised that greater BMI would be related to lower intention to exercise. Secondly, it was predicted that higher levels of social support (satisfaction and size of social network) would be related to greater intention to exercise. Also, it was hypothesised that higher levels of coping effort would be associated with greater intention to exercise.

Intention to Eat a Healthy Diet

It was hypothesised that higher levels of social support (satisfaction and size of social network) would be associated with greater intention to eat a healthy diet. Lastly, it was hypothesised that greater coping effort would be related to greater intention to eat a healthy diet.

Method

Participants

Participants were people who had been diagnosed with Coronary Heart Disease or had been advised to make changes to their lifestyle for their heart health (due to high risk of developing CHD) and their support persons. To be eligible to participate patients had to be able to engage in low to moderate physical activity. People who reported serious co-morbid health problems (eg. renal failure, malignancy, heart failure and stroke), major cognitive impairment, and those who lived in nursing homes were excluded from the study.

There were 69 people who completed the questionnaires. Twelve people reported being the main support person for a loved one with heart health concerns, but having no health problems or

concerns themselves. This gave low statistical power to examine the relationship between support persons and people with heart concerns or problems in terms of their heart health related behaviours. Data from these 12 people were therefore excluded from further analyses. This left 57 people who reported a diagnosis of CHD (n = 38) or that they had medical advice to change lifestyle factors to improve their heart health (n = 19). Ten were female, 42 were male and there was no response on gender for 5 participants. They ranged in age from 43 to 89 years, with a mean of 66 years (*SD* = 10.96).

Materials

The Health Related Quality of Life Questionnaire (Sintonen, 1981; 15 items; α =.86) was used to measure general health. It assesses 15 different dimension of global health, such as vitality and mobility. For each item, participants were asked to indicate their level of impairment on that dimension. For example; *Vitality: I feel...*

healthy and energetic

slightly weary, tired or feeble

moderately weary, tired or feeble

very weary, tired or feeble, almost exhausted

extremely weary, tired or feeble, totally exhausted

Responses are scored on a 5 point scale, ranging from '1' no impairment, through to '5' severe impairment on a given health dimension. Item scores are summed with higher scores indicating worse general health.

Intention to engage in health promoting behaviours was measured using items adapted from the Theory of Planned Behaviour Questionnaire (Ajzen, 2002). Two items assessed intention to engage in physical activity, and two items assessed intention to eat a low fat diet. Participants were asked to rate the likelihood of engaging in physical activity and eating a low fat diet over the next week, from 'extremely unlikely' (1) through to 'extremely likely' (7), and

to rate the truthfulness of their two statements regarding their intentions from 'definitely false' (1) through to 'definitely true' (7). The scores for items regarding physical activity and diet were summed separately, resulting in two scale scores; *intention to exercise*, and *intention to eat a low-fat diet*. Higher scores indicate greater intention to engage in these health promoting behaviours. The alpha level for the original measure is sound (Ajzen, 2002; α =.80).

The Centre for Epidemiological Studies Depression Scale (Radloff, 1977) is a widely used measure in clinical and health psychology literature to assess depression (α = .90; Radloff, 1977). It consists of 20 items, which ask participants to rate the frequency in the last week that they have experienced depression related symptoms, ranging from 'rarely or none of the time' (0) through to 'most of the time' (3). Items 4, 8, 12 and 16 are reverse scored and scores are summed with higher scores indicating higher levels of depression. A score of equal to, or greater than, 16 suggests a diagnosis of major depressive disorder.

The Social Support Questionnaire (Sarason, Sarason, Shearin & Pierce, 1987; α =.97) was used to measure social support. It consists of 12 items which ask how many people participants have to support them in a variety of circumstances (6-items), and how satisfied they are with the support provided in the given situation (6-items), from 'very dissatisfied' (1) to 'very satisfied' (7). The measure is scored by adding the number of people available for support and dividing it by 6 (the number of items) to create a social support network size sub-scale (SS-N). The social support satisfaction scale (SS-S) is calculated by adding the satisfaction scores and dividing by 6. Higher scores indicate a higher number of people available for social support and greater satisfaction with social support provision, respectively.

The International Physical Activity Questionnaire (Booth, 2000; α = .80) was used to measure physical activity. It consists of 27 items and asks participants to record how many days in the past week they have participated in a variety of different physical activities, and the duration they spent exercising on these days. Scores were weighted according to metabolic

load associated with a given activity level. A higher score indicates greater time and level of physical exertion through physical activity.

Dietary fat intake was measured using the Short Questionnaire for the Assessment of the Intake of Fat (Rohrmann & Klein, 2003; $\alpha = .70$). It consists of 20 items and asks participants to indicate how often they eat a variety of foods, from 'Once a day or more' (1) through to 'Once a month, less or never' (5). Items are summed, with higher scores indicating lower dietary fat intake.

The Brief Cope (Carver, 1997; $\alpha = .70$) consists of 28 items that assessed use of coping behaviours. Participants rate how often they used a number of different coping styles to cope with challenges to managing their heart health from 'I haven't been doing this at all' (1) through to 'I have been doing this a lot' (4). Items were summed with higher scores indicating a greater number of coping strategies used, and thus greater coping effort employed by the person.

Demographic Information was collected from participants. This included information about age, gender, employment status, occupation, marital status, country of birth, educational attainment, whether or not participants live alone, and Aboriginal and Torres Strait Islander status.

Additional Questions were asked with regards to weight, height, medical information, current lifestyle, lifestyle changes and obstacles to behaviour change (see Appendix B).

Procedure

Participants were recruited through the UTAS School of Psychology on-line study web page (n= 12), a General Practitioner, and an allied-health professional at the Royal Hobart Hospital. The local GP and the allied health professional provided brochures describing the study and recruitment procedures to their patients who meet the study criteria (see Appendix A). Potential participants were able to elect to complete the assessment booklet as either a pen

and paper or web based questionnaire (see Appendix B for assessment booklet). This study was approved by the Tasmanian Scientific Research Advisory Committee and the Human Research Ethics Committee. The references number provided for the present study was H0009142.

Results

Data Cleaning

Data from 57 participants was analysed. A computer program called Statistical Package for the Social Sciences (SPSS), version 17, was used to analyse the data.

Univariate and multivariate diagnostic tests were conducted using SPSS REGRESSION, FREQUENCIES and EXPLORE to check statistical assumptions. Prior to computing scale scores for the measures used, missing values on questionnaire items were examined. Where less than five percent of the items that made up a questionnaire were missing, the missing data points were replaced with mean scores on that measure, a procedure recommended by Tabachnick and Fidell (2001). Where more than five percent of scores were missing on a questionnaire, the remaining data points on those cases were removed.

Univariate checks for normality were conducted on health, intention to exercise, intention to eat a healthy diet, depression, social support number, social support satisfaction, fat intake, physical activity and coping effort. A visual check of normality revealed acceptable normality for health, depression, intention to exercise, intention to eat a healthy diet and fat intake. Less than optimum shape was revealed for social support satisfaction, social support number, physical activity and coping effort.

A check for skewness and kurtosis revealed acceptable values for health, intention to exercise, intention to eat a healthy diet and depression. Social support number, social support satisfaction, fat intake physical activity and coping effort did not fall within an acceptable range for

skewness and kurtosis. Values for kurtosis and skewness were calculated (skewness/standard error and kurtosis/standard error) and were considered acceptable if they fell within plus or minus three, as recommended by Tabachnick and Fidell (2001).

Transformations were not performed to remedy the less than perfect normality, skewness and kurtosis on the offending variables because of concerns about reducing statistical power. The removal of outliers was considered as an option to improve skewness and kurtosis.

Using the extreme values table and box and whisker plots, a univariate outlier was revealed on fat intake for one case. Upon removal of that case on fat intake, skewness and kurtosis were greatly improved hence meeting statistical assumptions of normality. An outlier was also revealed on physical activity, however, after its removal the values for skewness and kurtosis did not fall within the acceptable range, so the score on that case was retained. Some outliers on coping effort were identified, however, their removal did not adequately improve skewness or kurtosis, so they were retained. An aggregate score was calculated to produce a single summed score of coping effort rather than using each sub-scale of the brief cope individually in the regression analyses, a procedure previously employed by Scott, et al. (2004).

Descriptive statistics on measures used in the study for patients are displayed in Table 1. Table 1 demonstrates that in the sample the mean score on general health (25.48) was higher than would be expected for the general population (18.8; Saarni, Harkanen, Sintonen, Suvisari, Kosinen, Aromaa & Lonnqvist, 2006) . The scores on general health ranged from fairly healthy through to very unhealthy. Participants' mean scores on intention to exercise and intention to eat a healthy diet were fairly high. The mean score on depression for participants fell just below the range for mild depression. There was a lot of variation in scores on depression. A relatively large proportion of the sample reported high scores on depression. About twenty-five percent of participants scored above the clinical cut off point for depression. The average scores on social support indicated that there is high satisfaction with social support, but that participants in the sample had relatively small social

networks.

Table 1

Descriptive Statistics for Patients

	N	Range	Mean	SD
General Health	56	33	25.48	7.75
Intention to Exercise	55	12	9.96	3.98
Intention to Eat a Healthy Diet	55	11	10.35	3.59
Depression	55	30	9.51	8.33
Social Support – Number	50	54	18.36	13.22
Social Support – Satisfaction	49	30	29.02	10.22
Fat Intake	52	21	81.58	5.57
Physical Activity	51	47520	7906.39	11113.96
Coping Effort	53	41	44.15	9.79

Table 1 also indicates that on average the sample had a relatively high intake of fat in their diet. There was a lot of variation in physical activity in the sample, with many participants engaging in low levels of physical activity and many engaging in high levels of physical activity. The table also indicates that on average coping effort was low in this sample.

Frequencies for 'other' health problems can be seen in Table 2. It illustrates that arthritis and joint problems, reported as a co-morbid health problem by about $1/5^{th}$ of the sample, was the most commonly co-occurring health problem, followed by high blood pressure, then diabetes. Of the sample 3.5% of participants reported experiencing depression.

Table 2

Responses Rates to Item – 'Do you have any other medical conditions or health problems?'

Medical Conditions/Health Problems	Percentage (N = 57)
None	48.86%
Arthritis or Joint Problems	19.29%
High Blood Pressure	14.03%
Diabetes	12.28%
Thyroid Problems	5.26%
Hernia	5.26%
Lung Problems	5.26%
Eye Problems	5.26%
Kidney Problems	5.26%
Back Problems	3.51%
Depression	3.51%
Asthma	3.51%
Atrial Fibrillation	3.51%
Haemorrhoids	1.75%
Hearing Problems	1.75%
Osteoporosis	1.75%
Gall Stones	1.75%
Prostate Problems	1.75%
Epilepsy	1.75%

Frequencies of treatments for heart health can be seen in Table 3. It shows that the most common treatment reported by patients was medication (50%), followed by lifestyle change (29%),

then other (24%), stent placement (20.3%), then bypass surgery (18.8%).Ten percent of the sample reported that CR was a part of their treatment.

Table 3

Response Rates to Item – 'What has your treatment involved?'

Treatment	Percentage (N = 69)
Medication	50.7%
Lifestyle Change	29%
Other	24.6%
Stent/Angioplasty	20.3%
Bypass Surgery	18.8%
Cardiac Rehabilitation	10.1%
None	5.8%
Heart Transplant	1.4%

Table 4 present the frequencies of health behaviours patients have tried to change, the most common being reducing fat intake, which was reported by more than two thirds of the sample. The second most frequent health behaviour they tried to change was increasing physical activity, at a little over half the sample. This was followed by trying to reduce stress, reported by about one third of the sample. As can be seen in Table 5, the main reported obstacle related to enhancing their health was related to exercise. Obstacles related to healthy eating were also reported as important.

Table 4

Response Rates to Item – 'Please indicate the health behaviours you have tried to change'

Health Behaviour	Percentage (N = 69)
Reduce Fat Intake	69.6%
Increase Physical Activity	58%
Reduce Stress Levels	36.2%
Reduce Alcohol Consumption	27.5%
Reduce or Quit Smoking	20.3%
None of the Above	5.8%

Table 5

Response Rates to Item - 'Please indicate the main obstacles you have tried to overcome or manage in order to improve your heart health'

Obstacles	Patients (N = 57)
Finding an exercise to suit me Finding time to exercise	36.8%
Changing to a low fat diet	28.1%
Difficulty ordering healthy food when eating out	24.6%
Knowing what to eat when I am hungry	22.8%
Learning how to cook differently	22.8%
Dealing with the elements when exercising outside	21.1%
Finding time to exercise	21.1%
Finding time to relax	19.3%
Difficulty limiting alcohol intake in social situations	19.3%
Other	17.54%
Balancing the demands of work and home life	14.0%
Difficulty quitting smoking	14.0%
Refraining from smoking around other smokers	8.8%
Feeling overwhelmed by information about heart health	8.8%
Finding information about healthy lifestyle	1.8%

Regression Diagnostics for Prediction of Health, Intention to Exercise and Intention to Eat a Healthy Diet

The Studentized Deleted Residuals analysis revealed no multivariate outliers as did a test of Mahalanobis Distance and Cook's Distance. Correlations between predictor variables

were examined to check for multicollinearity and were found to be below .90. Tolerance values were examined and were found to be above .01. The residual plots were visually checked for homoscedasticity, of which there was no violation of assumptions. As suggested by Tabachnick and Fidell (2001) a conservative estimate of R^2 which has been adjusted for the population ($adjR^2$) has been used to represent the amount of variance in the criterion accounted for by the predictors. Missing data was dealt with during analysis using pairwise deletion.

Three regression models were used to determine the predictive value of psychosocial variables over and above the effects of demographic variables on three criterion variables; health, intention to exercise, and intention to eat a healthy diet. It was initially proposed that physical activity and fat intake would be used as criterion variables, however, the correlations between fat intake and physical activity and the variables that could be influenced through therapeutic intervention (depression, social support and coping effort) were weak and none were significant. These correlations are displayed in Table 6. ANOVA analyses were conducted to determine whether there was an effect when health, intention to exercise and intention to eat a healthy diet were split over gender. No effects were found at significance level of .05. Bivariate correlations were conducted between the criterion variables and sociodemographic variables to determine which variable would be entered into each model at block 1. Highest level of education completed (education) was significantly negatively correlated with health ($r = -.40, p < .001$). Intention to exercise was found to be significantly related to body mass index (BMI), $r = -.319, p < .05$. None of the sociodemographic variables surveyed were found to be significantly related to intention to eat a healthy diet. Therefore, none of the sociodemographic variables were entered into block one of the regression adopted to predict intention to eat a healthy diet.

Table 6

Bivariate Correlations of Measures Used in the Study

	1◦	2◦	3◦	4◦	5◦	6◦	7◦	8◦	9◦	10◦	11◦	12◦	13◦
1◦ Health	1	-	-	-	-	-	-	-	-				
2◦ Intention to Exercise	-.317*	1	-	-	-	-	-	-	-				
3◦ Intention to Eat a Healthy Diet	-.142	.400**	1	-	-	-	-	-	-				
4◦ Depression	.569**	-.188	-.250	1	-	-	-	-	-				
5◦ Social Support – Number	-.090	.342*	.404**	-.177	1	-	-	-	-				
6◦ Social Support – Satisfaction	.017	.356*	.312*	-.223	.340*	1	-	-	-				
7◦ Fat Intake	.005	.024	.369**	.086	.060	-.009	1	-	-				
8◦ Physical Activity	-.362**	.368**	.259	-.232	.232	.176	.020	1	-				
9◦ Coping Effort	.185	.004	.173	.363**	.007	.011	-.050	-.043	1				
10◦ Age	.222	-.119	-.051	-.046	-.225	-.088	-.252	-.131	-.125	1	-	-	-
11◦Highest Education Level Completed	-.403**	.252	.038	-.101	.245	.150	-.009	.375**	.155	-.214	1	-	-
12◦ Body Mass Index	.224	-.319*	.049	.143	.018	.031	-.017	-.141	-.003	-.402**	-.145	1	-
13◦ Time Since Diagnosis	.228	-.182	-.177	.027	-.172	-.013	-.030	-.002	-.172	.190	-.074	.065	1

* $p < .05$

** $p < .01$

Hierarchical Multiple Regression Analysis – Health

For the first regression model, education was entered into block 1, depression into block 2, social support satisfaction into block 3, social support number into block 4 and coping effort into block 5. When education was entered into block 1, it significantly predicted health ($N = 52$), ($R = .40$, $F(1,45) = 8.73$, $p < .05$). The amount of variance in health accounted for by education was 16.3 percent, ($R^2 = .16$, $adjR^2 = .14$, $F = (1,45) = 8.73$, $p < .05$). When depression was entered into the model with education in block 2, ($R = .67$, $F(1,44) = 17.58$, $p < .001$). The amount of variance in health accounted for by education and depression was 44.4 percent, ($R^2 = .44$, $adjR^2 = .42$, $F(1,44) = 17.58$, $p < .05$. There was a significant increment of variance in health of 28.2 percent which was accounted for by depression, ($R^2\Delta = .28$, $F\Delta$ (1,44) = 22.30, $p < .001$). When social support satisfaction was entered into the model with education and depression in block 3, ($R = .69$, $F(3,43) = 13.35$, $p < .001$). The amount of variance in health accounted for by education, depression and social support satisfaction was 48.2 percent, ($R^2 = .48$, $adjR^2 = .45$, $F(3,43) = 13.35$, $p <. 001$). The increment of variance in health accounted for by social support satisfaction was not significant. When social support number was entered into the model with education, depression and social support satisfaction in block 4, ($R = .70$, $F(4,42) = 9.83$, $p < .001$). The amount of variance in health accounted for by education, depression, social support satisfaction and social support number was 48.4 percent, ($R^2 = .48$, $F(4,42) = 9.83$, $p < .001$). The increment of variance in health accounted for by social support number was not significant. When coping effort was entered into the model with education, depression, social support satisfaction and social support number in block 5, (R = .70, F(5,41) = 7.72, p <.001). The amount of variance in health accounted for by education, depression, social support satisfaction, social support number and coping effort was 48.5 percent, ($R^2 = .49$, F(5,41) = 7.72, p <.001). The increment of variance

in health accounted for by coping effort was not significant.

An analysis of semi-partial squared correlations revealed that education accounted for 13.69 percent of unique variance in health, $sr^2 = .14$, $p < .05$. It also indicated that depression accounted for 25.30 percent of the unique variance in health, $sr^2 = .25$, $p < .001$. There was no significant unique variance in health accounted for by social support satisfaction, social support number or coping effort

The relative weights for each predictor were calculated. The relative weights indicated that depression accounted for the greatest amount of variance in the total explained variance in health (RW = 66.3 %), followed by education (RW = 32.4%), coping effort (RW = 1.45%), social support number (RW = .78%) and social support satisfaction (RW = .66%).

The confidence intervals for *B* were calculated at a 95 percent confidence interval and confirmed that significant variables did not span zero. Displayed in Table 7 are the unstandardised *B* coefficients, standardised β coefficients, the unique variance (sr^2), the relative weights and the lower and upper confidence intervals for each variable.

Table 7

Statistics Concerning the Overall Relationship Between Health and Predictor Variables

	B	B	sr^2	Relative Weights	Confidence Intervals for B Lower Bounds	Confidence Intervals for B Upper Bounds
Education	-2.519	-.390	.137*	.324	-4.061	-.977
Depression	.526	.565	.253**	.662	.289	.762
Social Support Satisfaction	.142	.187	.029	.006	-.044	.328
Social Support Number	.025	.042	.001	.008	-.120	.170
Coping Effort	.030	.038	.001	.013	-.167	.227
			$\Sigma sr^2 = .421$	$\Sigma RW = 1$		
			* $p < .05$			
			** $p < .001$			

Hierarchical Multiple Regression Analysis – Intention to Exercise

The second model was used to predict intention to exercise; body mass index (BMI) was entered into block 1, social support number into block 2, social support satisfaction into block 3 and coping effort into block 4. When BMI was entered into block 1, it did not significantly predict intention to exercise, however, it was approaching significance, $p = .054$. BMI did not account for a significant amount of variance in intention to exercise. When social support number was entered into the model with BMI in block 2, $R = .47$, $F(2,34) = 4.87$, $p < .05$. The amount of variance in intention to exercise accounted for by BMI and social support number was 22.3 percent, ($R^2 = .22$, $adjR^2 = .17$, $F(2,34) = 4.87$, $p < .05$. There was a significant increment of variance in intention to exercise of 12.1 percent which was accounted for by social support number ($R^2\Delta = .12$, $F\Delta\ (1,34) = 5.30$, $p < .05$). When social

support satisfaction was entered into the model with BMI and social support number in block 3, $R = .54$, $F(3,33) = 4.54$, $p < .05$. The amount of variance in intention to exercise accounted for by BMI, social support number and social support satisfaction was 29.2 percent ($R^2 = .29$, $adjR^2 = .22$, $F(3,33) = 4.54$, $p <. 05$). The increment of variance in intention to exercise accounted for by social support satisfaction was not significant. When coping effort was entered into the model with BMI, social support number and social support satisfaction in block 4, $R = .54$, $F(4,32) = 3.30$, $p < .05$. The amount of variance in health accounted for by BMI, social support number, social support satisfaction and coping effort was 29.2 percent ($R^2 = .29$, $F(4,32) = 3.30$, $p < .05$). The increment of variance in intention to exercise accounted for by coping effort was not significant ($R^2\Delta = .00$, $F\Delta\ (1,35) = .00$, *ns*).

An analysis of semi-partial squared correlations revealed that BMI accounted for 11.02 percent of unique variance in intention to exercise, $sr^2 = .11$, $p < .05$. There was no significant unique variance in intention to exercise accounted for by social support number ($sr^2 = .05$, *ns*), social support satisfaction ($sr^2 = .07$, *ns*) or coping effort ($sr^2 = .00$, *ns*).

The relative weights for each predictor were calculated. The relative weights indicated that BMI accounted for the greatest amount of variance in the total explained variance in intention to exercise (RW = 36.26 %), followed by social support satisfaction (RW = 34.13%), social support number (RW = 29.63%) and coping effort (RW = .002%)

The confidence intervals for *B* were calculated at a 95 percent confidence interval and confirmed that significant variables did not span zero. Displayed in Table 8 are the unstandardised *B* coefficients, standardised β coefficients, the unique variance (sr^2), the relative weights and the lower and upper confidence intervals for each variable.

Table 8

Statistics Concerning the Overall Relationship Between Intention to Exercise and Predictor Variables

	B	B	sr^2	Relative Weights	Confidence Intervals for B Lower Bounds	Confidence Intervals for B Upper Bounds
BMI	-.290	-.332	.111*	.367	-.554	-.025
Social Support Number	.076	.253	.057	.293	-.021	.173
Social Support Satisfaction	.109	.280	.069	.341	-.016	.234
Coping Effort	.000	-.002	.000	.000	-.124	.122
			$\Sigma sr^2 = .237$	$\Sigma RW = 1$		
			* $p < .05$			

Hierarchical Multiple Regression Analysis – Intention to Eat a Healthy Diet

The third model was used to predict intention to eat a healthy diet. Social support number was entered into block 1, social support satisfaction into block 2 and coping effort into block 3. When social support number was entered into block 1, it significantly predicted intention to eat a healthy diet ($N = 55$), $R = .40$, $F(1,46) = 8.96$, $p < .05$. The amount of variance in intention to eat a healthy diet accounted for by social support number was16.30%, $R^2 = .16$, $adjR^2 = .15$, $F = (1,46) = 8.96$, $p < .05$. When social support satisfaction was entered into the model with social support number in block 2, $R = .45$, $F(2,45) = 5.54$, $p < .05$. The amount of variance in intention to eat a healthy diet accounted for by social support number and social support satisfaction was 19.80 percent, ($R^2 = .20$, $adjR^2 = .16$, $F(2,45) = 5.54$, $p <$ .05. There increment of variance in intention to eat a healthy diet accounted for by social support satisfaction was not significant. When coping effort was entered into the model with

social support number and social support satisfaction in block 3, $R = .48$, $F(3,44) = 4.28$, $p < .05$. The amount of variance in intention to eat a healthy diet accounted for by social support number, social support satisfaction and coping effort was 22.60 percent ($R^2 = .226$, $adjR^2 = ..17$, $F(3,44) = 4.28$, $p <. 05$). The increment of variance in intention to eat a healthy diet accounted for by coping effort was not significant.

An analysis of semi-partial squared correlations revealed that social support number accounted for 3.15 percent of unique variance in intention to eat a healthy diet, $sr^2 = .03$, $p < .05$. There was no significant unique variance in intention to eat a healthy diet accounted for by social support satisfaction or coping effort.

The relative weights for each predictor were calculated. The relative weights indicated that social support number accounted for the greatest amount of variance in the total explained variance in intention to exercise (RW = 60.07 %), followed by social support satisfaction (RW = 27.07%), and coping effort (RW = .12.86%)

The confidence intervals for *B* were calculated at a 95 percent confidence interval and confirmed that significant variables did not span zero. Displayed in Table 9 are the unstandardised *B* coefficients, standardised β coefficients, the unique variance (sr^2), the relative weights and the lower and upper confidence intervals for each variable.

Table 9

Statistics Concerning the Overall Relationship Between Intention to Eat a Healthy Diet and Predictor Variables

	B	B	sr^2	Relative Weights	Confidence Intervals for B Lower Bounds	Confidence Intervals for B Upper Bounds
Social Support Number	.091	.336	.031*	.601	.014	.168
Social Support Satisfaction	.069	.196	.034	.271	-.031	.169
Coping Effort	.062	.168	.028	.129	-.036	.160
			$\Sigma sr^2 = .093$	$\Sigma RW = 1$		
			* $P < .05$			

Discussion

The aim of the present study was to explore the predictive value of depression, level of educational attainment, social support, coping effort and BMI on health, physical activity and dietary fat intake. In particular, unique variance of these predictor variables on health and the aforementioned health behaviours was of interest. Due to non-significant zero order correlations between predictor variables and physical activity and dietary fat intake, intention to exercise and intention to eat a healthy diet were used as outcome variables rather than the actual behaviours.

Findings of the study suggest that there is a negative relationship between health and depression, and a positive relationship between level of educational attainment and health. These findings and those concerning the other hypotheses will be explored further, followed by a discussion of the limitations of the study, potential future research, implications and conclusions.

Prediction of Health

The hypothesis that education would predict (have a positive relationship with) health was supported by the results. Findings from the analysis indicate that a higher level of education completion predicts better overall perceived general health. This is consistent with results of previous research by Mack, et al. (2004) who found that higher levels of educational attainment are related to greater SES, which in turn predicts better overall health.

Much of the previous research about the impact of socio-demographic factors on health has focussed on SES and employment status on health, but not so much the direct relationship between educational attainment and health. However, the findings of the present study indicate that educational attainment itself is a significant predictor of unique variance in health, which may not have previously received much attention in the area of heart disease. It could be postulated that through higher educational attainment, people may have higher incomes, enjoy a higher standard of living, have greater job opportunities and choice, be able to afford better health care and have been exposed to more information about health, diet and exercise. Many of these factors are also likely to impact directly on day to day stress levels, which in turn have an effect on health. It would be interesting to explore the relationship between educational attainment and health in a population with a high rate of unemployment, or in a sample of participants who are not in the work force, for a chance to reduce the effect of factors relating to work.

In deciding which socio-demographic information to gather for the present study, occupation was chosen rather than income to give an indication of SES. It would have been useful to have collected information about income to have been able to remove potential co-variance within the education and health relationship, however, respondents often do not like to provide information about their income, especially over the internet. Unfortunately, due to the large proportion of participants who were not in the workforce, the information collected

about occupation provided limited utility with regards to SES.

The hypothesis that depression would predict (have a negative relationship with) health was supported by the results of the regression analysis. This implies that a greater level of perceived depression predicts worse overall perceived general health. This is supported by previous findings by Wulsin et al. (2009) and Yusef et al. (2005). Wulsin et al. (2009) found that depression is an independent risk for CHD, and henceforth health, whilst Yusef et al.'s (2005) findings indicate that depression accounts for additional CHD risk, above and beyond traditional CHD risk factors.

The above finding may be explained by the way depression impacts on activity levels and self-care, which can lead to declining general physical health. Commonly when people become depressed they become less physically active, may put on weight and be less proactive about caring for their physical health (i.e. Visit a GP about a changing mole, quit smoking, eat a healthy diet or reduce alcohol intake). However, in terms of previous research the aetiological link between depression and health is not well understood. For greater understanding of this link for the purpose of patients with CHD, an investigation into the relationship between depression and heart health, using a heart health specific measure, may provide new insights.

The hypothesis that social support (satisfaction and number) would predict (have a positive relationship) health was not supported by the results. These findings differ from those of Eriksen (1994), who found that greater levels of social support are related to lower levels of cardiac mortality and morbidity, and in turn, greater general health. Findings by Hamer (2006) were similar, in finding greater marital distress was related to higher prevalence and faster progression of atherosclerosis.

It is interesting to consider the disparity between self-rated depression as reported (by only 3% of participants) in the item asking whether participants have any other health or

medical problems and the proportion of participants whose scores on the CES-D were above the clinical cut of for depression (about 25%). This may indicate that a large proportion of people with CHD experience symptoms of depression, but are not aware of it. This has great implications for the treatment of depression in people with CHD. It may be beneficial for GP's and other health professionals involved in care of patients with CHD to routinely screen for the presence of depression, which may aid in these patients adjustment and well-being.

Taking into consideration the large body of research with findings of significant relationships between social support and health, and social support and cardiac health, it could be thought that the findings of the present study were due to factors related to the study design, measures or sample size. It may be that the measure of social support did not have enough items to differentiate between participants with high and low social support considering the relatively small sample size.

The hypothesis that coping (effort) would predict (be positively related to) health was not supported by the results. It is difficult to compare this finding with those from previous studies, as the use of an aggregate coping effort scale has not been used previously in exploring coping and health in the heart disease area. Considering that previous studies have found significant relationships between active coping and passive coping on well-being at different times in the CHD experience (Bedi & Brown, 2005; Van Eldern, et al., 1999), it begs the question of how meaningful it is to use this aggregate coping scale. However, it is possible that coping effort may have been found to be related to health with the use of a larger sample size.

Prediction of Intention to Exercise

The hypothesis that BMI would predict (be negatively related to) intention to exercise was supported by the findings. It is difficult to relate this to previous findings as there has not

been any investigation into this relationship in the heart disease area before, however, it is widely believed that the greater the BMI, the less likely a person is to exercise or intend to exercise. This may be because greater body weight or obesity is seen as a barrier to exercise or may lead to co-morbid physical or mental health problems, such as depression, anxiety, diabetes, joint problems and chronic pain, which themselves may act as barriers to exercise.

The hypothesis that social support would (be positively related to) predict intention to exercise was partly supported by the results of the regression analysis. Social support satisfaction was not significantly related to intention to exercise, but there was some relationship between size of social network (social support number) and intention to exercise. There was no significant unique variance in intention to exercise accounted for by social support number. However, when social support number was entered into the regression model, there was a significant increment of variance in intention to exercise. This indicates that social support number accounts for some shared variance in intention to exercise. These results share some similarities with previous findings by Rankin-Esquer et al. (1997), that non-married and separated CHD patients are less likely to have good health behaviours following an acute cardiac event. Care should be taken when interpreting this result, as the measures of social support and the measure of intention to exercise are constructed of a small number of items. Hence, had the sample size been larger, more significant results may have been uncovered.

The hypothesis that coping would predict intention to exercise was not supported by the findings. A previous study by Van Eldern et al. (1999) found that approach and avoidance as coping styles predicted well-being differently at different time points. It could be postulated that well-being in these CHD patients is related to exercise and intention to exercise, therefore the results of the present study are not consistent with Van Eldern et al's findings.

Caution should be taken when interpreting these results due to the use of the aggregate coping effort measure, the relatively small sample size and small number of items on the intention to exercise measure. Future research could further explore the relationship between coping and exercise, and coping and intention to exercise, by using a measure of coping with items specific to people with heart health concerns/CHD and using a larger sample size.

Prediction of Intention to Eat a Healthy Diet

The hypothesis that social support (number and satisfaction) would predict intention to eat a healthy diet was partly supported by the findings. The results suggest that the greater the number of people in a persons social network, the greater their intention to eat a healthy diet. This result shares some consistencies with findings by Rankin-Esquer et al. (1997); that married patients are more likely to adopt positive health behaviours after an acute cardiac event, that is, if being married is related to having a larger social support.

Again caution should be taken when interpreting this result. The present study involved a relatively small sample size and the measures for intention to eat a healthy diet had a small number of items. Significant medium strength bivariate correlations were found between intention to eat a healthy diet and social support –number and social support-satisfaction. Therefore, it could be expected that if the present study was conducted with a larger sample size, both social support-number and social support-satisfaction may be significant predictors of unique variance in intention to eat a healthy diet.

The hypothesis that coping (effort) would predict intention to eat a healthy diet was not supported by the results. The finding of this relationship as being non-significant is probably due to, as previously mentioned, a combination of the relatively small sample size, the use of the aggregate coping effort scale the and small number of items for the measure of intention to exercise.

Limitations of the Study

The findings and interpretations of the present study into predictors of health and health behaviour in people with heart health concerns are limited in a number of ways. Firstly, as previously mentioned, the sample size for the study was relatively small, which impacts on the value of the findings in a number of ways. Due to the small sample size it was not possible to compare the CHD diagnosis group with the heart health concerns group. By combining those with a CHD diagnosis and those with heart health concerns into one group, it is likely that this created noise in the data, which may have resulted in reduced predictive validity of depression, education, BMI, social support and coping on intended health behaviours and general health perceptions. It would have been useful to have compared these groups to examine whether having an acute cardiac event or diagnosis of CHD, rather than less serious heart health concerns, provides a greater ability to predict outcomes. Secondly, it would have also been useful to have a large enough sample size to compare groups across gender and also to compare those who are depressed versus those who are not depressed. Thirdly, with a larger sample size, significant results may have been obtained for relationships where one or both of the measures used had a small number of items, such as intention to exercise, intention to eat a healthy diet and social support.

The use of the coping effort aggregate score rather than the usual brief cope subscales may have reduced the meaningfulness of findings, as it does not discriminate between different types of coping, which may be more or less beneficial, such as active and passive coping. There seems to be a limited number of coping measures available that would be useful for this kind of study, therefore the development of a heart-health specific coping measure could provide more useful findings for future studies.

The use of intention to exercise, and intention to eat a healthy diet rather than physical activity and fat intake (actual behaviours) is another limitation of the present study. As there

are many factors that affect the relationship between intention and actual behaviour, this would have resulted in a loss of information about the direct relationship between the predictor variables and actual health behaviours. However, there is use in looking at predictors of intention. It is just that it provides different information than what was initially being sought in the present study.

The characteristics of the sample used are another limitation of the study. Approximately half of the participants were recruited from the pacemaker clinic at a local public hospital. Patients of this clinic are more likely to have characteristics such as long term heart problems, specifically with difficulty with maintaining a regular heart beat. It is likely that this subgroup of the sample have other shared characteristics that may be different from the general population, which limits generalisability of the results, provides more noise within the data, and with any relatively small sample, this can be problematic. The sample also includes many more men than women, a low average on level of educational attainment and a large proportion of retired participants. All of these factors limit the generalisability of interpretations. However, with any relatively small sample, these types of proportions in sample characteristics can be problematic.

Although there are a number of limitations to the present study, they are mostly related to sample size which is a common issue for studies conducted as part of a Masters degree, and despite the limitations, useful interpretations can still be made.

Conclusions

The present study was undertaken in an effort to further understand the complex set of relationships which can impact on the health and wellbeing of people with heart health concerns or a diagnosis of CHD. The results of the investigation impart evidence that lower perceived depression and higher educational attainment predict significant better overall general health, both providing unique variance. Also BMI accounted for unique variance in

intention to exercise, where lower BMI predicts greater intention to exercise. Further, the size of social support network was found to account for unique variance in intention to eat a healthy diet, with a greater social network size predicting higher intention to eat a healthy diet. Neither social support nor coping effort accounted for significant unique variance in intention to exercise. Also, social support satisfaction and coping effort did not predict significant unique variance in intention to eat a healthy diet. These findings may have been significant if a larger sample size had been used.

In conclusion, the present study provides evidence to support the importance of screening for depression in patients with CHD and the importance of treating depression in primary and secondary prevention of heart disease. Also, these findings highlight the importance of primary prevention of CHD and general health promotion, especially in people with low levels of educational attainment. It would be useful to overcome the limitations of this study in future research to increase the application of the findings.

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Appendix A – Invitational Brochure

Interested?

If you want to participate in the project, or find out more information, please phone:

Annabelle Young
on (03) 6226 6619.
Or go to...

www.utas.edu.au/psychol/participate_experiment/rhd/annabelle.htm

To complete the questionnaire booklet online

The questionnaire booklet takes approximately 30 minutes to complete

This study has been approved by the Human Research Ethics Committee (Tasmania) Network. It is part of Ms Annabelle Young's Masters Thesis in Psychology.

Project Collaborators

University of Tasmania
School of Psychology

Chief Investigator: Dr Jenn Scott
Co-Investigator: Dr Raimondo Bruno
Ms Annabelle Young

UTAS

FACULTY OF SCIENCE, ENGINEERING & TECHNOLOGY

School of Psychology

Helping People **COPE** with Coronary Heart Disease and Heart Health Concerns

Appendix B – Assessment Booklet

Heart Health Questionnaire

Section A

This section asks about you or your loved one's medical information

1. I am someone who...

Please choose *only one* of the following:

- ☐ is a support person for a loved one with heart health concerns
- ☐ has been told by your GP to lose weight, reduce your blood pressure or lower your cholesterol for your heart health
- ☐ has been diagnosed with Coronary Heart Disease
- ☐ is a support person for someone with heart health concerns as well as having my own heart health concerns

2. How long ago did you (or your loved one) receive the diagnosis of Coronary Heart Disease OR discover that for medical reasons you needed to lose weight, reduce blood pressure, lower cholesterol or make other lifestyle changes in order to improve your heart health

Please choose *only one* of the following:

- ☐ During the last week
- ☐ During the last month
- ☐ During the last 6 months
- ☐ During the last year
- ☐ During the last 2 years
- ☐ During the last 5 years
- ☐ More than 5 years ago

3. What has your (or your loved one's) treatment involved?

Please choose *all* that apply:

- ☐ Nothing
- ☐ Lifestyle change
- ☐ Cardiac Rehabilitation
- ☐ Medication
- ☐ Stent/angioplasty
- ☐ Bypass surgery
- ☐ Heart transplant
- ☐ Other

4. If you are a support person for a loved one with heart health concerns, what is your relationship to them?

Please choose *only one* of the following:

- ☐ Spouse/partner
- ☐ Relative
- ☐ Friend
- ☐ Other

5. How much do you weigh in kilograms?

Please write your answer here:

6. What is your height in centimetres?

Please write your answer here:

7. Do you have any other medical conditions or health problems?

Please write your answer here:

8. From the list below please indicate the health behaviours you (or your loved one) have tried to change?

Please choose *all* that apply:

- ☐ Increase physical activity
- ☐ Reduce fat intake
- ☐ Reduce alcohol intake
- ☐ Reduce or quit smoking
- ☐ Reduce stress levels
- ☐ None of the above

Section B

Please read through all the alternative responses to each question before placing a mark against the alternative which best describes your present health status. Continue through all 15 questions in this manner **giving only one answer to each**. See next page

1. Mobility

Please choose *only one* of the following:

- ☐ I am able to walk normally (without difficulty) indoors, outdoors and on stairs.
- ☐ I am able to walk without difficulty indoors, but outdoors and/or on stairs I have slight difficulties.
- ☐ I am able to walk without help indoors (with or without an appliance), but outdoors and/or on stairs only with considerable difficulty or with help from others.
- ☐ I am able to walk indoors only with help from others.
- ☐ I am completely bed-ridden and unable to move about.

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2. Vision

Please choose *only one* of the following:

- ☐ I see normally, ie I can read newspapers and TV text without difficulty (with or without glasses).
- ☐ I can read papers and/or TV text with slight difficulty (with or without glasses).
- ☐ I can read papers and/or TV text with considerable difficulty (with or without glasses).
- ☐ I cannot read papers or TV text either with glasses or without, but I can see enough to walk about without guidance.
- ☐ I cannot see enough to walk about without a guide, ie I am almost or completely blind.

---

3. Hearing

Please choose *only one* of the following:

- ☐ I can hear normally, ie normal speech (with or without a hearing aid).
- ☐ I hear normal speech with a little difficulty.
- ☐ I hear normal speech with considerable difficulty; in conversation I need voices to be louder than normal.
- ☐ I hear even loud voices poorly; I am almost deaf.
- ☐ I am completely deaf.

---

4. Breathing

Please choose *only one* of the following:

- ☐ I am able to breathe normally ie with no shortness of breath or other breathing difficulty.
- ☐ I have shortness of breath during heavy work or sports, or when walking briskly on flat ground or slightly uphill.
- ☐ I have shortness of breath when walking on flat ground at the same speed as others my age
- ☐ I get shortness of breath even after light activity, eg washing or dressing myself.
- ☐ I have breathing difficulties almost all the time, even when resting.

---

5. Sleeping

Please choose *only one* of the following:

- ☐ I am able to sleep normally, ie I have no problems with sleeping.
- ☐ I have slight problems with sleeping, eg difficulty in falling asleep, or sometimes waking at night.
- ☐ I have moderate problems with sleeping, eg disturbed sleep, or feeling I have not slept enough.
- ☐ I have great problems with sleeping, eg having to use sleeping pills often or routinely, or usually waking at night and/or too early in the morning.
- ☐ I suffer severe sleeplessness, eg sleep is almost impossible even with full use of sleeping pills, or staying awake most of the night.

6. Eating

Please choose *only one* of the following:

- I am able to eat normally, ie with no help from others.
- I am able to eat by myself with minor difficulty (eg slowly, clumsily, shakily, with special appliances).
- I need some help from another person in eating.
- I am unable to eat by myself at all, so I must be fed by another person.
- I am unable to eat at all, so I am fed either by tube or intravenously.

7. Speech

Please choose *only one* of the following:

- ☐ I am able to speak normally, ie clearly, audibly and fluently.
- ☐ I have slight speech difficulties, eg occasional fumbling for words, mumbling, or changes of pitch.
- ☐ I can make myself understood, but my speech is eg disjointed, faltering, stuttering or stammering.
- ☐ Most people have great difficulty understanding my speech.
- ☐ I can only make myself understood by gestures.

8. Elimination

Please choose *only one* of the following:

- ☐ My bladder and bowel work normally and without problems.
- ☐ I have slight problems with my bladder and/or bowel function, eg difficulties with urination, or loose or hard bowels.
- ☐ I have marked problems with my bladder and/or bowel function, eg. occasional 'accidents', or severe constipation or diarrhea.
- ☐ I have serious problems with my bladder and/or bowel function, eg. routine 'accidents', or need of catheterization or enemas.
- ☐ I have no control over my bladder and/or bowel function.

9. Usual activities

Please choose *only one* of the following:

- ☐ I am able to perform my usual activities (eg employment, studying, housework, free-time activities) without difficulty.
- ☐ I am able to perform my usual activities slightly less effectively or with minor difficulty.
- ☐ I am able to perform my usual activities much less effectively, with considerable difficulty, or not completely.
- ☐ I can only manage a small proportion of my previously usual activities.
- ☐ I am unable to manage any of my previously usual activities.

10. Mental function

Please choose *only one* of the following:

- ☐ I am able to think clearly and logically, and my memory functions well.
- ☐ I have slight difficulties in thinking clearly and logically, or my memory sometimes fails me.
- ☐ I have marked difficulties in thinking clearly and logically, or my memory is somewhat impaired.
- ☐ I have great difficulties in thinking clearly and logically, or my memory is seriously impaired.
- ☐ I am permanently confused and disoriented in place and time.

11. Discomfort and symptoms

Please choose *only one* of the following:

- ☐ I have no physical discomfort or symptoms, eg pain, ache, nausea, itching etc.
- ☐ I have mild physical discomfort or symptoms, eg pain, ache, nausea, itching etc.
- ☐ I have marked physical discomfort or symptoms, eg pain, ache, nausea, itching etc.
- ☐ I have severe physical discomfort or symptoms, eg pain, ache, nausea, itching etc.
- ☐ I have unbearable physical discomfort or symptoms, eg pain, ache, nausea, itching etc.

12. Depression

Please choose *only one* of the following:

- ☐ I do not feel at all sad, melancholic or depressed.
- ☐ I feel slightly sad, melancholic or depressed.
- ☐ I feel moderately sad, melancholic or depressed.
- ☐ I feel very sad, melancholic or depressed.
- ☐ I feel extremely sad, melancholic or depressed.

13. Distress

Please choose *only one* of the following:

- ☐ I do not feel at all anxious, stressed or nervous.
- ☐ I feel slightly anxious, stressed or nervous.
- ☐ I feel moderately anxious, stressed or nervous.
- ☐ I feel very anxious, stressed or nervous.
- ☐ I feel extremely anxious, stressed or nervous.

14. Vitality

Please choose *only one* of the following:

- ☐ I feel healthy and energetic.
- ☐ I feel slightly weary, tired or feeble.
- ☐ I feel moderately weary, tired or feeble.
- ☐ I feel very weary, tired or feeble, almost exhausted.
- ☐ I feel extremely weary, tired or feeble, totally exhausted.

15. Sexual activity

Please choose *only one* of the following:

- ☐ My state of health has no adverse effect on my sexual activity.
- ☐ My state of health has a slight effect on my sexual activity.
- ☐ My state of health has a considerable effect on my sexual activity.
- ☐ My state of health makes sexual activity almost impossible.
- ☐ My state of health makes sexual activity impossible.

Section C

1. I intend to do at least 30 minutes of physical activity on most days of the forthcoming week.

Please choose *only one* of the following:

- ☐ Definitely false
- ☐ Mostly false
- ☐ A little false
- ☐ Unsure
- ☐ A little true
- ☐ Mostly true
- ☐ Definitely true

2. I will do at least 30 minutes of physical activity on most days of the next week

Please choose *only one* of the following:

- ☐ Extremely unlikely
- ☐ Unlikely
- ☐ A little unlikely
- ☐ Unsure
- ☐ A little likely
- ☐ Likely
- ☐ Extremely Likely

3. I intend to eat a low-fat diet over the forthcoming week.

Please choose *only one* of the following:

- ☐ Definitely false
- ☐ Mostly false
- ☐ A little false
- ☐ Unsure
- ☐ A little true
- ☐ Mostly true
- ☐ Definitely true

4. I will eat a low-fat diet over the next week.

Please choose *only one* of the following:

- ☐ Extremely unlikely
- ☐ Unlikely
- ☐ A little unlikely
- ☐ Unsure
- ☐ A little likely
- ☐ Likely
- ☐ Extremely likely

Section D

Below is a list of some of the ways you may have felt or behaved. Please indicate how often you have felt this way during **the past week** by checking the appropriate space.

1. I was bothered by things that usually don't bother me

Please choose *only one* of the following:

- ☐ Rarely or none of the time (less than 1 day)
- ☐ Some or a little of the time (1-2 days)
- ☐ Occasionally or a moderate amount of the time (3-4 days)
- ☐ Most or all of the time (5-7 days)

2. I did not feel like eating; my appetite was poor

Please choose *only one* of the following:

- ☐ Rarely or none of the time (less than 1 day)
- ☐ Some or a little of the time (1-2 days)
- ☐ Occasionally or a moderate amount of the time (3-4 days)
- ☐ Most or all of the time (5-7 days)

3. I felt that I could not shake off the blues even with help from my family or friends

Please choose *only one* of the following:

- ☐ Rarely or none of the time (less than 1 day)
- ☐ Some or a little of the time (1-2 days)
- ☐ Occasionally or a moderate amount of the time (3-4 days)
- ☐ Most or all of the time (5-7 days)

4. I felt that I was just as good as other people.

Please choose *only one* of the following:

- ☐ Rarely or none of the time (less than 1 day)
- ☐ Some or a little of the time (1-2 days)
- ☐ Occasionally or a moderate amount of the time (3-4 days)
- ☐ Most or all of the time (5-7 days)

5. I had trouble keeping my mind on what I was doing.

Please choose *only one* of the following:

- ☐ Rarely or none of the time (less than 1 day)
- ☐ Some or a little of the time (1-2 days)
- ☐ Occasionally or a moderate amount of the time (3-4 days)
- ☐ Most or all of the time (5-7 days)

6. I felt depressed.

Please choose *only one* of the following:

- ☐ Rarely or none of the time (less than 1 day)
- ☐ Some or a little of the time (1-2 days)
- ☐ Occasionally or a moderate amount of the time (3-4 days)
- ☐ Most or all of the time (5-7 days)

7. I felt that everything was an effort.

Please choose *only one* of the following:

- ☐ Rarely or none of the time (less than 1 day)
- ☐ Some or a little of the time (1-2 days)
- ☐ Occasionally or a moderate amount of the time (3-4 days)
- ☐ Most or all of the time (5-7 days)

8. I felt hopeful about the future.

Please choose *only one* of the following:

- ☐ Rarely or none of the time (less than 1 day)
- ☐ Some or a little of the time (1-2 days)
- ☐ Occasionally or a moderate amount of the time (3-4 days)
- ☐ Most or all of the time (5-7 days)

---

9. I thought my life had been a failure.

Please choose *only one* of the following:

- ☐ Rarely or none of the time (less than 1 day)
- ☐ Some or a little of the time (1-2 days)
- ☐ Occasionally or a moderate amount of the time (3-4 days)
- ☐ Most or all of the time (5-7 days)

---

10. I felt fearful.

Please choose *only one* of the following:

- ☐ Rarely or none of the time (less than 1 day)
- ☐ Some or a little of the time (1-2 days)
- ☐ Occasionally or a moderate amount of the time (3-4 days)
- ☐ Most or all of the time (5-7 days)

---

11. My sleep was restless.

Please choose *only one* of the following:

- ☐ Rarely or none of the time (less than 1 day)
- ☐ Some or a little of the time (1-2 days)
- ☐ Occasionally or a moderate amount of the time (3-4 days)
- ☐ Most or all of the time (5-7 days)

---

12. I was happy.

Please choose *only one* of the following:

- ☐ Rarely or none of the time (less than 1 day)
- ☐ Some or a little of the time (1-2 days)
- ☐ Occasionally or a moderate amount of the time (3-4 days)
- ☐ Most or all of the time (5-7 days)

---

13. I talked less than usual.

Please choose *only one* of the following:

- ☐ Rarely or none of the time (less than 1 day)
- ☐ Some or a little of the time (1-2 days)
- ☐ Occasionally or a moderate amount of the time (3-4 days)
- ☐ Most or all of the time (5-7 days)

---

14. I felt lonely.

Please choose *only one* of the following:

- ☐ Rarely or none of the time (less than 1 day)
- ☐ Some or a little of the time (1-2 days)
- ☐ Occasionally or a moderate amount of the time (3-4 days)
- ☐ Most or all of the time (5-7 days)

---

15. People were unfriendly.

Please choose *only one* of the following:

- ☐ Rarely or none of the time (less than 1 day)
- ☐ Some or a little of the time (1-2 days)
- ☐ Occasionally or a moderate amount of the time (3-4 days)
- ☐ Most or all of the time (5-7 days)

---

16. I enjoyed life.

Please choose *only one* of the following:

- ☐ Rarely or none of the time (less than 1 day)
- ☐ Some or a little of the time (1-2 days)
- ☐ Occasionally or a moderate amount of the time (3-4 days)
- ☐ Most or all of the time (5-7 days)

---

17. I had crying spells.

Please choose *only one* of the following:

- ☐ Rarely or none of the time (less than 1 day)
- ☐ Some or a little of the time (1-2 days)
- ☐ Occasionally or a moderate amount of the time (3-4 days)
- ☐ Most or all of the time (5-7 days)

---

18. I felt sad.

Please choose *only one* of the following:

- ☐ Rarely or none of the time (less than 1 day)
- ☐ Some or a little of the time (1-2 days)
- ☐ Occasionally or a moderate amount of the time (3-4 days)
- ☐ Most or all of the time (5-7 days)

---

19. I felt that people disliked me.

Please choose *only one* of the following:

- ☐ Rarely or none of the time (less than 1 day)
- ☐ Some or a little of the time (1-2 days)
- ☐ Occasionally or a moderate amount of the time (3-4 days)
- ☐ Most or all of the time (5-7 days)

---

20. I could not get "going".

Please choose *only one* of the following:

- ☐ Rarely or none of the time (less than 1 day)
- ☐ Some or a little of the time (1-2 days)
- ☐ Occasionally or a moderate amount of the time (3-4 days)
- ☐ Most or all of the time (5-7 days)

Section E

The following questions ask about people in your environment who provide you with help or support. Each question has two parts. For the first part, list all the people you know, excluding yourself, whom you can count on for help or support in the manner described. Give the persons' initials and their relationships to you (see example). Do not list more than one person next to each of the numbers beneath the question. For the second part, indicate which response is most accurate in reflecting your satisfaction with this type of support. If you have had no support for a question, check the option 'No one', but still rate your level of satisfaction. Do not list more than 9 persons per question. Please answer all the questions as best you can.

EXAMPLE:
Who do you know whom you can trust with information that could get you in trouble (use initials and relationship to you)?
No one 1) T.N. (brother) 2) L.M. (friend) 3) R.S. (friend) 4) T.N. (father) 5) L.M. (employer) 6) 7) 8) 9)

How satisfied (are you with this support)?
1) very dissatisfied 2) fairly dissatisfied 3) a little dissatisfied 4) a little satisfied 5) fairly satisfied 6) very satisfied

1. Whom can you really count on to be dependable when you need help?

Please write each person's initials and relationship to you:

- ☐ No one
- ☐ 1) _____
- ☐ 2) _____
- ☐ 3) _____
- ☐ 4) _____
- ☐ 5) _____
- ☐ 6) _____
- ☐ 7) _____
- ☐ 8) _____
- ☐ 9) _____

2. How satisfied?

Please choose *only one* of the following:

- ☐ Very dissatisfied
- ☐ Fairly dissatisfied
- ☐ A little dissatisfied
- ☐ A little satisfied
- ☐ Fairly satisfied
- ☐ Very satisfied
- ☐

3. Whom can you really count on to help you feel more relaxed when you are under pressure or tense?

Please write each person's initials and relationship to you:

☐ No one	
☐ 1)	
☐ 2)	
☐ 3)	
☐ 4)	
☐ 5)	
☐ 6)	
☐ 7)	
☐ 8)	
☐ 9)	

4. How satisfied?

(Whom can you really count on to help you feel more relaxed when you are under pressure or tense)?

Please choose *only one* of the following:

- ☐ Very dissatisfied
- ☐ Fairly dissatisfied
- ☐ A little dissatisfied
- ☐ A little satisfied
- ☐ Fairly satisfied
- ☐ Very satisfied

5. Who accepts you totally, including both your worst and best points?

Please write each person's initials and relationship to you:

☐ No one	
☐ 1)	
☐ 2)	
☐ 3)	
☐ 4)	
☐ 5)	
☐ 6)	
☐ 7)	
☐ 8)	
☐ 9)	

6. How satisfied?

(Who accepts you totally, including both your worst and best points?)

Please choose *only one* of the following:

- ☐ Very dissatisfied
- ☐ Fairly dissatisfied
- ☐ A little dissatisfied
- ☐ A little satisfied
- ☐ Fairly satisfied
- ☐ Very satisfied

7. Whom can you really count on to care about you, regardless of what's happening to you?

Please write each person's initials and relationship to you:

☐ No one	
☐ 1)	
☐ 2)	
☐ 3)	
☐ 4)	
☐ 5)	
☐ 6)	
☐ 7)	
☐ 8)	
☐ 9)	

8. How satisfied?

(Whom can you really count on to care about you, regardless of what's happening to you?)

Please choose *only one* of the following:

- ☐ Very dissatisfied
- ☐ Fairly dissatisfied
- ☐ A little dissatisfied
- ☐ A little satisfied
- ☐ Fairly satisfied
- ☐ Very satisfied

9. Whom can you really count on to help you feel better when you are feeling generally down-in-the-dumps?

Please write each person's initials and relationship to you:

☐ No one	
☐ 1)	
☐ 2)	
☐ 3)	
☐ 4)	
☐ 5)	
☐ 6)	
☐ 7)	
☐ 8)	
☐ 9)	

10. How satisfied?

(Whom can you really count on to help you feel better when you are feeling generally down-in-the-dumps?)

Please choose *only one* of the following:

- ☐ Very dissatisfied
- ☐ Fairly dissatisfied
- ☐ A little dissatisfied
- ☐ A little satisfied
- ☐ Fairly satisfied
- ☐ Very satisfied

11. Whom can you count on to console you when you are very upset?

Please write each person's initials and relationship to you:

☐ No one	
☐ 1)	
☐ 2)	
☐ 3)	
☐ 4)	
☐ 5)	
☐ 6)	
☐ 7)	
☐ 8)	
☐ 9)	

12. How satisfied?

(Whom can you count on to console you when you are very upset?)

Please choose *only one* of the following:

- ☐ Very dissatisfied
- ☐ Fairly dissatisfied
- ☐ A little dissatisfied
- ☐ A little satisfied
- ☐ Fairly satisfied
- ☐ Very satisfied

Section F

We are interested in finding out about the kinds of physical activities that people do as part of their everyday lives. The questions will ask you about the time you spent being physically active in the **last 7 days**. Please answer each question even if you do not consider yourself to be an active person. Please think about the activities you do at work, as part of your house and yard work, to get from place to place, and in your spare time for recreation, exercise or sport. Think about all the **vigorous** and **moderate** activities that you did in the **last 7 days**. **Vigorous** physical activities refer to activities that take hard physical effort and make you breathe much harder than normal. **Moderate** activities refer to activities that take moderate physical effort and make you breathe somewhat harder than normal.

1. PART 1: JOB-RELATED PHYSICAL ACTIVITY

The first section is about your work. This includes paid jobs, farming, volunteer work, course work, and any other unpaid work that you did outside your home. Do not include unpaid work you might do around your home, like housework, yard work, general maintenance, and caring for your family. These are asked in Part 3.

Do you currently have a job or do any unpaid work outside your home?

No ***Skip to PART 2: TRANSPORTATION***

Please choose *only one* of the following:

☐ Yes

☐ No

---

2. The next questions are about all the physical activity you did in the ***last 7 days*** as part of your paid or unpaid work. This does not include travelling to and from work.

During the last 7 days, on how many days did you do vigorous physical activities like heavy lifting, digging, heavy construction, or climbing up stairs as part of your work? Think about only those physical activities that you did for at least 10 minutes at a time (DAYS PER WEEK).

No vigorous job-related physical activity ***Skip to question 4***

Please write your answer here:

---

3. How much time did you usually spend on one of those days doing vigorous physical activities as part of your work (MINUTES PER DAY)?

Please write your answer here:

---

4. Again, think about only those physical activities that you did for at least 10 minutes at a time. During the last 7 days, on how many days did you do moderate physical activities like carrying light loads as part of your work? Please do not include walking (DAYS PER WEEK).

No moderate job-related physical activity ***Skip to question 6***

Please write your answer here:

---

5. How much time did you usually spend on one of those days doing moderate physical activities as part of your work (MINUTES PER DAY)?

Please write your answer here:

---

6. During the last 7 days, on how many days did you walk for at least 10 minutes at a time as part of your work (DAYS PER WEEK)? Please do not count any walking you did to travel to or from work.

No job-related walking ***Skip to PART 2: TRANSPORTATION***

Please write your answer here:

---

7. How much time did you usually spend on one of those days walking as part of your work (MINUTES PER DAY)?

Please write your answer here:

8. ***PART 2: TRANSPORTATION PHYSICAL ACTIVITY***

These questions are about how you travelled from place to place, including to places like work, stores, movies, and so on.

During the last 7 days, on how many days did you travel in a motor vehicle like a train, bus, car, or tram (DAYS PER WEEK)?

No travelling in a motor vehicle ***Skip to question 10***	Please write your answer here:

---

9. How much time did you usually spend on one of those days travelling in a train, bus, car, tram, or other kind of motor vehicle (MINUTES PER DAY)?

Please write your answer here:

---

10. *Now think only about the bicycling and walking you might have done to travel to and from work, to do errands, or to go from place to place.*

During the last 7 days, on how many days did you bicycle for at least 10 minutes at a time to go from place to place (DAYS PER WEEK)?

No bicycling from place to place ***Skip to question 12***	Please write your answer here:

---

11. How much time did you usually spend on one of those days to bicycle from place to place (MINUTES PER DAY)?

Please write your answer here:

---

12. During the last 7 days, on how many days did you walk for at least 10 minutes at a time to go from place to place (DAYS PER WEEK)?

No walking from place to place ***Skip to PART 3: HOUSEWORK, HOUSE MAINTENANCE, AND CARING FOR FAMILY***	Please write your answer here:

---

13. How much time did you usually spend on one of those days walking from place to place (MINUTES PER DAY)?

Please write your answer here:

---

14. ***PART 3: HOUSEWORK, HOUSE MAINTENANCE, AND CARING FOR FAMILY***

This section is about some of the physical activities you might have done in the last 7 days in and around your home, like housework, gardening, yard work, general maintenance work, and caring for your family.

Think about only those physical activities that you did for at least 10 minutes at a time. During the last 7 days, on how many days did you do vigorous physical activities like heavy lifting, chopping wood, shovelling snow, or digging in the garden or yard (DAYS PER WEEK)?

No vigorous activity in garden or yard ***Skip to question 16***	Please write your answer here:

---

15. How much time did you usually spend on one of those days doing vigorous physical activities in the garden or yard (MINUTES PER DAY)?

Please write your answer here:

16. Again, think about only those physical activities that you did for at least 10 minutes at a time. During the last 7 days, on how many days did you do moderate activities like carrying light loads, sweeping, washing windows, and raking in the garden or yard (DAYS PER WEEK) ?

No moderate activity in garden or yard ***Skip to question 18***

Please write your answer here:

17. How much time did you usually spend on one of those days doing moderate physical activities in the garden or yard (MINUTES PER DAY)?

Please write your answer here:

18. Once again, think about only those physical activities that you did for at least 10 minutes at a time. During the last 7 days, on how many days did you do moderate activities like carrying light loads, washing windows, scrubbing floors and sweeping inside your home (DAYS PER WEEK)?

No moderate activity inside home ***Skip to PART 4: RECREATION, SPORT AND LEISURE-TIME PHYSICAL ACTIVITY***

Please write your answer here:

19. How much time did you usually spend on one of those days doing moderate physical activities inside your home (MINUTES PER DAY)?

Please write your answer here:

20. *PART 4: RECREATION, SPORT, AND LEISURE-TIME PHYSICAL ACTIVITY*

This section is about all the physical activities that you did in the last 7 days solely for recreation, sport, exercise or leisure. Please do not include any activities you have already mentioned.

Not counting any walking you have already mentioned, during the last 7 days, on how many days did you walk for at least 10 minutes at a time in your leisure time (DAYS PER WEEK)?

No walking in leisure time ***Skip to question 22***

Please write your answer here:

21. How much time did you usually spend on one of those days walking in your leisure time (MINUTES PER DAY)?

Please write your answer here:

22. Think about only those physical activities that you did for at least 10 minutes at a time. During the last 7 days, on how many days did you do vigorous physical activities like aerobics, running, fast bicycling, or fast swimming in your leisure time?

No vigorous activity in leisure time ***Skip to question 24***

Please write your answer here:

23. How much time did you usually spend on one of those days doing vigorous physical activities in your leisure time (MINUTES PER DAY)?

Please write your answer here:

---

24. Again, think about only those physical activities that you did for at least 10 minutes at a time. During the last 7 days, on how many days did you do moderate physical activities like bicycling at a regular pace, swimming at a regular pace, and doubles tennis in your leisure time (DAYS PER WEEK)?

No moderate activity in leisure time ***Skip to PART 5: TIME SPENT SITTING***

Please write your answer here:

---

25. How much time did you usually spend on one of those days doing moderate physical activities in your leisure time (MINUTES PER DAY)?

Please write your answer here:

---

26. *PART 5: TIME SPENT SITTING*

The last questions are about the time you spend sitting while at work, at home, while doing course work and during leisure time. This may include time spent sitting at a desk, visiting friends, reading or sitting or lying down to watch television. Do not include any time spent sitting in a motor vehicle that you have already told me about.

During the last 7 days, how much time did you usually spend sitting on a weekday (HOURS PER DAY)?

Please write your answer here:

---

27. During the last 7 days, how much time did you usually spend sitting on a weekend day (HOURS PER DAY)?

Please write your answer here:

Section G

How often do you eat the following food items? Please mark in each line the frequency that fits best your usual consumption habits. *If you do not eat any* of the foods mentioned in a line, please mark 'once a month, less or never'

1. Bratwurst (frying sausage)

Please choose *only one* of the following:

- ☐ Once a day or more
- ☐ 4-6 Times a week
- ☐ 1-3 Times a week
- ☐ 2-3 Times a month
- ☐ Once a month, less or never

2. Sausages

Please choose *only one* of the following:

- ☐ Once a day or more
- ☐ 4-6 Times a week
- ☐ 1-3 Times a week
- ☐ 2-3 Times a month
- ☐ Once a month, less or never

3. Salami

Please choose *only one* of the following:

- ☐ Once a day or more
- ☐ 4-6 Times a week
- ☐ 1-3 Times a week
- ☐ 2-3 Times a month
- ☐ Once a month, less or never

4. Upper cuts

Please choose *only one* of the following:

- ☐ Once a day or more
- ☐ 4-6 Times a week
- ☐ 1-3 Times a week
- ☐ 2-3 Times a month
- ☐ Once a month. less or never

5. Fried chicken or other fried foods

Please choose *only one* of the following:

- ☐ Once a day or more
- ☐ 4-6 Times a week
- ☐ 1-3 Times a week
- ☐ 2-3 Times a month
- ☐ Once a month, less or never

6. Canned, broiled, smoked fish

Please choose *only one* of the following:

- ☐ Once a day or more
- ☐ 4-6 Times a week
- ☐ 1-3 Times a week
- ☐ 2-3 Times a month
- ☐ Once a month, less or never

7. 3.5% milk

Please choose *only one* of the following:

- ☐ Once a day or more
- ☐ 4-6 Times a week
- ☐ 1-3 Times a week
- ☐ 2-3 Times a month
- ☐ Once a month, less or never

8. Full-fat cheese

Please choose *only one* of the following:

- ☐ Once a day or more
- ☐ 4-6 Times a week
- ☐ 1-3 Times a week
- ☐ 2-3 Times a month
- ☐ Once a month, less or never

9. Boiled eggs

Please choose *only one* of the following:

- ☐ Once a day or more
- ☐ 4-6 Times a week
- ☐ 1-3 Times a week
- ☐ 2-3 Times a month
- ☐ Once a month, less or never

10. Scrambled eggs, egg salad, omelette

Please choose *only one* of the following:

- ☐ Once a day or more
- ☐ 4-6 Times a week
- ☐ 1-3 Times a week
- ☐ 2-3 Times a month
- ☐ Once a month, less or never

11. Egg white, egg yolk, dried egg

Please choose *only one* of the following:

- ☐ Once a day or more
- ☐ 4-6 Times a week
- ☐ 1-3 Times a week
- ☐ 2-3 Times a month
- ☐ Once a month, less or never

12. Butter

Please choose *only one* of the following:

- ☐ Once a day or more
- ☐ 4-6 Times a week
- ☐ 1-3 Times a week
- ☐ 2-3 Times a month
- ☐ Once a month, less or never

13. Margarine

Please choose *only one* of the following:

- ☐ Once a day or more
- ☐ 4-6 Times a week
- ☐ 1-3 Times a week
- ☐ 2-3 Times a month
- ☐ Once a month, less or never

14. Salad oil

Please choose *only one* of the following:

- ☐ Once a day or more
- ☐ 4-6 Times a week
- ☐ 1-3 Times a week
- ☐ 2-3 Times a month
- ☐ Once a month, less or never

15. Bacon, lard

Please choose *only one* of the following:

- ☐ Once a day or more
- ☐ 4-6 Times a week
- ☐ 1-3 Times a week
- ☐ 2-3 Times a month
- ☐ Once a month, less or never

16. Nuts

Please choose *only one* of the following:

- ☐ Once a day or more
- ☐ 4-6 Times a week
- ☐ 1-3 Times a week
- ☐ 2-3 Times a month
- ☐ Once a month, less or never

17. French fries

Please choose *only one* of the following:

- ☐ Once a day or more
- ☐ 4-6 Times a week
- ☐ 1-3 Times a week
- ☐ 2-3 Times a month
- ☐ Once a month, less or never

18. Pasta

Please choose *only one* of the following:

- ☐ Once a day or more
- ☐ 4-5 Times a week
- ☐ 1-3 Times a week
- ☐ 2-3 Times a month
- ☐ Once a month, less or never

19. Sponge cake, biscuit

Please choose *only one* of the following:

- ☐ Once a day or more
- ☐ 4-6 Times a week
- ☐ 1-3 Times a week
- ☐ 2-3 Times a month
- ☐ Once a month, less or never

20. Flan, layer cake, tart

Please choose *only one* of the following:

- ☐ Once a day or more
- ☐ 4-6Times a week
- ☐ 1-3 Times a week
- ☐ 2-3 Times a month
- ☐ Once a month, less or never

Section H

These items ask about the ways you cope with the news that you (or your loved one) needs to manage heart health concerns or improve their heart health. Don't answer on the basis of whether it seems to be working or not—just whether or not you're doing it. Use these response choices. Try to rate each item separately in your mind from the others. Make your answers as true FOR YOU as you can.

1. **I've been turning to work or other activities to take my mind off things.**

Please choose *only one* of the following:

- ☐ I haven't been doing this at all
- ☐ I've been doing this a little bit
- ☐ I've been doing this a medium amount
- ☐ I've been doing this a lot

---

2. **I've been concentrating my efforts on doing something about the situation I'm in.**

Please choose *only one* of the following:

- ☐ I haven't been doing this at all
- ☐ I've been doing this a little bit
- ☐ I've been doing this a medium amount
- ☐ I've been doing this a lot

---

3. **I've been saying to myself "this isn't real.".**

Please choose *only one* of the following:

- ☐ I haven't been doing this at all
- ☐ I've been doing this a little bit
- ☐ I've been doing this a medium amount
- ☐ I've been doing this a lot

---

4. **I've been using alcohol or other drugs to make myself feel better.**

Please choose *only one* of the following:

- ☐ I haven't been doing this at all
- ☐ I've been doing this a little bit
- ☐ I've been doing this a medium amount
- ☐ I've been doing this a lot

---

5. **I've been getting emotional support from others.**

Please choose *only one* of the following:

- ☐ I haven't been doing this at all
- ☐ I've been doing this a little bit
- ☐ I've been doing this a medium amount
- ☐ I've been doing this a lot

---

6. **I've been giving up trying to deal with it.**

Please choose *only one* of the following:

- ☐ I haven't been doing this at all
- ☐ I've been doing this a little bit
- ☐ I've been doing this a medium amount
- ☐ I've been doing this a lot

---

7. I've been taking action to try to make the situation better.

Please choose *only one* of the following:

- ☐ I haven't been doing this at all
- ☐ I've been doing this a little bit
- ☐ I've been doing this a medium amount
- ☐ I've been doing this a lot

---

8. I've been refusing to believe that it has happened.

Please choose *only one* of the following:

- ☐ I haven't been doing this at all
- ☐ I've been doing this a little bit
- ☐ I've been doing this a medium amount
- ☐ I've been doing this a lot

---

9. I've been saying things to let my unpleasant feelings escape.

Please choose *only one* of the following:

- ☐ I haven't been doing this at all
- ☐ I've been doing this a little bit
- ☐ I've been doing this a medium amount
- ☐ I've been doing this a lot

---

10. I've been getting help and advice from other people.

Please choose *only one* of the following:

- ☐ I haven't been doing this at all
- ☐ I've been doing this a little bit
- ☐ I've been doing this a medium amount
- ☐ I've been doing this a lot

---

11. I've been using alcohol or other drugs to help me get through it.

Please choose *only one* of the following:

- ☐ I haven't been doing this at all
- ☐ I've been doing this a little bit
- ☐ I've been doing this a medium amount
- ☐ I've been doing this a lot

---

12. I've been trying to see it in a different light, to make it seem more positive.

Please choose *only one* of the following:

- ☐ I haven't been doing this at all
- ☐ I've been doing this a little bit
- ☐ I've been doing this a medium amount
- ☐ I've been doing this a lot

---

13. I've been criticizing myself.

Please choose *only one* of the following:

- ☐ I haven't been doing this at all
- ☐ I've been doing this a little bit
- ☐ I've been doing this a medium amount
- ☐ I've been doing this a lot

14. I've been trying to come up with a strategy about what to do.

Please choose *only one* of the following:

- ☐ I haven't been doing this at all
- ☐ I've been doing this a little bit
- ☐ I've been doing this a medium amount
- ☐ I've been doing this a lot

15. I've been getting comfort and understanding from someone.

Please choose *only one* of the following:

- ☐ I haven't been doing this at all
- ☐ I've been doing this a little bit
- ☐ I've been doing this a medium amount
- ☐ I've been doing this a lot

16. I've been giving up the attempt to cope.

Please choose *only one* of the following:

- ☐ I haven't been doing this at all
- ☐ I've been doing this a little bit
- ☐ I've been doing this a medium amount
- ☐ I've been doing this a lot

17. I've been looking for something good in what is happening.

Please choose *only one* of the following:

- ☐ I haven't been doing this at all
- ☐ I've been doing this a little bit
- ☐ I've been doing this a medium amount
- ☐ I've been doing this a lot

18. I've been making jokes about it.

Please choose *only one* of the following:

- ☐ I haven't been doing this at all
- ☐ I've been doing this a little bit
- ☐ I've been doing this a medium amount
- ☐ I've been doing this a lot

19. I've been doing something to think about it less, such as going to movies, watching TV, reading, daydreaming, sleeping, or shopping.

Please choose *only one* of the following:

- ☐ I haven't been doing this at all
- ☐ I've been doing this a little bit
- ☐ I've been doing this a medium amount
- ☐ I've been doing this a lot

20. I've been accepting the reality of the fact that it has happened.

Please choose *only one* of the following:

- ☐ I haven't been doing this at all
- ☐ I've been doing this a little bit
- ☐ I've been doing this a medium amount
- ☐ I've been doing this a lot

21. I've been expressing my negative feelings.

Please choose *only one* of the following:

- ☐ I haven't been doing this at all
- ☐ I've been doing this a little bit
- ☐ I've been doing this a medium amount
- ☐ I've been doing this a lot

22. I've been trying to find comfort in my religion or spiritual beliefs.

Please choose *only one* of the following:

- ☐ I haven't been doing this at all
- ☐ I've been doing this a little bit
- ☐ I've been doing this a medium amount
- ☐ I've been doing this a lot

23. I've been trying to get advice or help from other people about what to do.

Please choose *only one* of the following:

- ☐ I haven't been doing this at all
- ☐ I've been doing this a little bit
- ☐ I've been doing this a medium amount
- ☐ I've been doing this a lot

24. I've been learning to live with it.

Please choose *only one* of the following:

- ☐ I haven't been doing this at all
- ☐ I've been doing this a little bit
- ☐ I've been doing this a medium amount
- ☐ I've been doing this a lot

25. I've been thinking hard about what steps to take.

Please choose *only one* of the following:

- ☐ I haven't been doing this at all
- ☐ I've been doing this a little bit
- ☐ I've been doing this a medium amount
- ☐ I've been doing this a lot

26. I've been blaming myself for things that happened.

Please choose *only one* of the following:

- ☐ I haven't been doing this at all
- ☐ I've been doing this a little bit
- ☐ I've been doing this a medium amount
- ☐ I've been doing this a lot

27. I've been praying or meditating.

Please choose *only one* of the following:

- ☐ I haven't been doing this at all
- ☐ I've been doing this a little bit
- ☐ I've been doing this a medium amount
- ☐ I've been doing this a lot

28. I've been making fun of the situation.

Please choose *only one* of the following:

- ☐ I haven't been doing this at all
- ☐ I've been doing this a little bit
- ☐ I've been doing this a medium amount
- ☐ I've been doing this a lot

Section I

1. Please rate how healthy you consider your lifestyle to be currently?

Please choose *only one* of the following:

- ☐ Not at all healthy
- ☐ Moderately unhealthy
- ☐ Neither healthy nor unhealthy
- ☐ Moderately healthy
- ☐ Extremely healthy

2. Please rate how close your current lifestyle or health behaviours are to your desired ideal healthy lifestyle?

Please choose *only one* of the following:

- ☐ Very far from my ideal
- ☐ Somewhat far from my ideal
- ☐ Neither close nor far from my ideal
- ☐ Somewhat close to my ideal
- ☐ Very close to my ideal

3. Please rate how confident you are that you can make and maintain changes to your lifestyle in order to improve your heart health

Please skip this question if you are a support person for someone with heart health concerns

Please choose *only one* of the following:

- ☐ Not at all confident
- ☐ Moderately unconfident
- ☐ Neither confident nor unconfident
- ☐ Moderately confident
- ☐ Very Confident

4. Please indicate the main obstacles you (or your loved one) have to overcome or manage in order to improve your heart health

Please choose all that apply:

- ☐ Finding time to exercise
- ☐ Finding an exercise to suit me
- ☐ Difficulty quitting smoking
- ☐ Finding information about healthy lifestyle
- ☐ Feeling overwhelmed by information about heart health
- ☐ Changing to a low fat diet
- ☐ Knowing what to eat when I am hungry
- ☐ Learning how to cooking differently
- ☐ Difficulty limiting alcohol intake in social situations
- ☐ Difficulty ordering healthy food when eating out
- ☐ Refraining from smoking around other smokers
- ☐ Balancing the demands of work and home life
- ☐ Finding time to relax
- ☐ Dealing with the elements (eg. rain, wind, cold) when exercising outside
- ☐ Other (please give details below)

_____

5. Please indicate how hard it has been for you to overcome these barriers or obstacles?

Please choose *only one* of the following:

- ☐ Very hard
- ☐ Moderately hard
- ☐ Indifferent
- ☐ Moderately easy
- ☐ Very easy

Section J

This is the last section. It asks questions about demographic information

1. What is your age?

Please write your answer here:

2. What is your gender?

Please choose *only one* of the following:

- ☐ Female
- ☐ Male

3. What is your employment status?

Please choose *only one* of the following:

- ☐ Unemployed
- ☐ Part time/casual
- ☐ Full time
- ☐ Retired
- ☐ Student

4. What is your occupation?

Please write your answer here:

5. What is your marital status?

Please choose *only one* of the following:

- ☐ Single
- ☐ Dating
- ☐ Defacto
- ☐ Married
- ☐ Separated/Divorced
- ☐ Widowed

6. Do you live alone?

Please choose *only one* of the following:

- ☐ Yes
- ☐ No

7. Which country were your born in?

Please write your answer here:

8. Do you have Aboriginal or Torres Strait Islander Heritage?

Please choose *only one* of the following:

- ☐ Yes
- ☐ No

9. What is the highest level of education you have completed?

Please choose *only one* of the following:

- ☐ Year 10 or below
- ☐ Year 11 or year 12
- ☐ Tafe level qualification
- ☐ University Bachelor Degree
- ☐ University Masters Degree
- ☐ University Doctoral Level Degree

Thank you for completing this survey.

Please post this survey back to the university in the pre-addressed envelope at your earliest convenience.